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U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office

Kemmerer Field Office, Rock Springs Field Office July 2001

ENVIRONMENTAL ASSESSMENT and FINDING OF NO SIGNIFICANT IMPACT

Opal Loop Natural Gas Pipeline and Compressor Station, Sublette, Sweetwater, and Lincoln Counties, Wyoming

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2002-005907/NF

MISSION STATEMENT

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Rock Springs Field Office
280 Highway 191 North
Rock Springs, Wyoming 82901-3448

1792 (040)
WYW152503
WY-040-EA01-119
OPAL LOOP EA

July 12, 2001

Dear Reviewer:

This Environmental Assessment (EA) and Finding of No Significant Impacts (FONSI) for the proposed Opal Loop Natural Gas Pipeline and Compressor Station Project is furnished for your review and comment. Written comments will be considered in the decision if they are received by August 20, 2001.

The decision on the proposed natural gas pipeline rights-of-way will be based upon the analysis in the EA, public concerns and comments, and other multiple-use resource objectives or programs that apply to the project. A Decision Record, detailing the decision of the BLM and its rationale for the decision, will be prepared and distributed upon request as soon as the decision is reached following the end of the 30-day review period.

Comments on the content of this EA should be sent to:

Mr. Arlan Hiner, Team Leader
Bureau of Land Management
280 Highway 191 North
Rock Springs, Wyoming 82901

The BLM appreciates the individuals, organizations, and Federal, State, and Local Governments who participate in the environmental analysis process. Your involvement enhances the integrity of the EA and the public land manager's ability to make an informed decision.

Sincerely,

Ted Murphy
Assistant Field Manager
Minerals and Lands

FINDING OF NO SIGNIFICANT IMPACT
OPAL LOOP NATURAL GAS PIPELINE AND COMPRESSOR STATION

Based on my review of the analysis of the Opal Loop Natual Gas Pipeline and Compressor Station Environmental Assessment (July, 2001). I have determined that the proposed action is in conformance with the approved land use plans and will not have any significant impacts on the human environment. Therefore, an environmental impact statement is not required. Further explanation of the finding is provided below.

The EA shows that adverse impacts to surface ownership/use and grazing; livestock management; socioeconomics/environmental justice; cultural resources; paleontology; soils/watersheds; water resources; air quality/noise; vegetation/riparian areas; wildlife and fisheries; threatened, endangered, candidate, and special status species; wild horses, visual resources; and from the use of hazardous materials would all be minor, short term, necessary and due impacts. Potentially substantial positive economic impacts could result for the companies, and local, state and federal governments.

Both the Kemmerer Resource Area Resource Management Plan and the Green River Resource Area Resource Management Plan provide for the use of these public lands for oil and natural gas development. The Proposed Action would be in conformance with these land use plans, and no amendments to the RMPs would be necessary to implement the Proposed Action.

Approval:

____
Rock Springs Field Manager

____
Date

ENVIRONMENTAL ASSESSMENT

OPAL LOOP

NATURAL GAS PIPELINE AND COMPRESSOR STATION

Prepared for

Bureau of Land Management
Rock Springs Field Office
Rock Springs, Wyoming
and
Bureau of Land Management
Kemmerer Field Office
Kemmerer, Wyoming

and

Bureau of Reclamation
Provo, Utah

This Environmental Analysis was prepared by *Gary Holsan Environmental Planning*, an environmental consulting firm, with the guidance, participation, and independent evaluation of the Bureau of Land Management (BLM). The BLM, in accordance with Federal regulation 40 CFR 1506.5(a) and (b), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.

July, 2001

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CHAPTER 1

PURPOSE AND NEED

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CHAPTER 1

PURPOSE AND NEED

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION AND LOCATION

1.1.1 Description

Jonah Gas Gathering Company (JGGC) is proposing to construct a buried natural gas pipeline and related facilities to transport natural gas produced from the Jonah and Pinedale Anticline fields for delivery to multiple markets. The capacity of existing pipelines in the area is insufficient to adequately transport anticipated natural gas supplies.

JGGC proposes to construct a pipeline with related facilities (including valves, metering equipment, and dehydrators) from a compressor site proposed adjacent to the existing Bird Canyon Compressor Station to the Williams Field Services Opal Plant in Opal, Wyoming (Figure 1-1). The Opal Loop Pipeline would pass through southern Sublette, northwestern Sweetwater, and eastern Lincoln counties (Figure 1-2). In addition, JGGC proposes to construct additional compression facilities adjacent to the Bird Canyon Compressor Station located at the northern end of the proposed pipeline.

1.2 PURPOSE OF AND NEED FOR ACTION

Exploration and development of federal oil and gas leases by private industry, including transport and delivery of produced oil/gas, is an integral part of the BLM's oil and gas program under authority of the Mineral Leasing Act of 1920 as amended, the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976, the National Materials and Minerals Policy, Research and Development Act of 1980, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987.

The BLM oil and gas program encourages development of domestic oil and gas reserves. Natural gas is an integral part of the United States' energy future due to its availability and the presence of the existing market delivery infrastructure. By developing domestic reserves of clean burning natural gas, the U.S. would reduce dependence on foreign energy, such as natural gas from Mexico and Canada. The environmental advantages of burning natural gas rather than oil or coal were emphasized by the U.S. Congress and by the President when the Clean Air Act Amendments of 1990 were signed into law.

The National Petroleum Council (NPC) was formed in 1946 to advise, inform and make recommendations to the Secretary of Energy on any matter requested by the Secretary relating to oil and natural gas and the oil and natural gas industries. In December 1999, the NPC issued a report titled *Natural Gas: Meeting the Challenges of the Nation's Growing Natural Gas Demand* (National Petroleum Council 1999). The report projects that U.S. natural gas consumption will increase 32 percent between 1998 and 2010. This would constitute a 7 trillion cubic feet (TCF) increase, from the 1998 level of 22 TCF to 29 TCF in 2010. Much of the incremental demand is projected for use in the generation of electricity.

To meet this growing demand, the report projects that U.S. domestic gas production would increase from the 1998 level of 19 TCF to 25 TCF in 2010. The remaining demand will be met by imports of

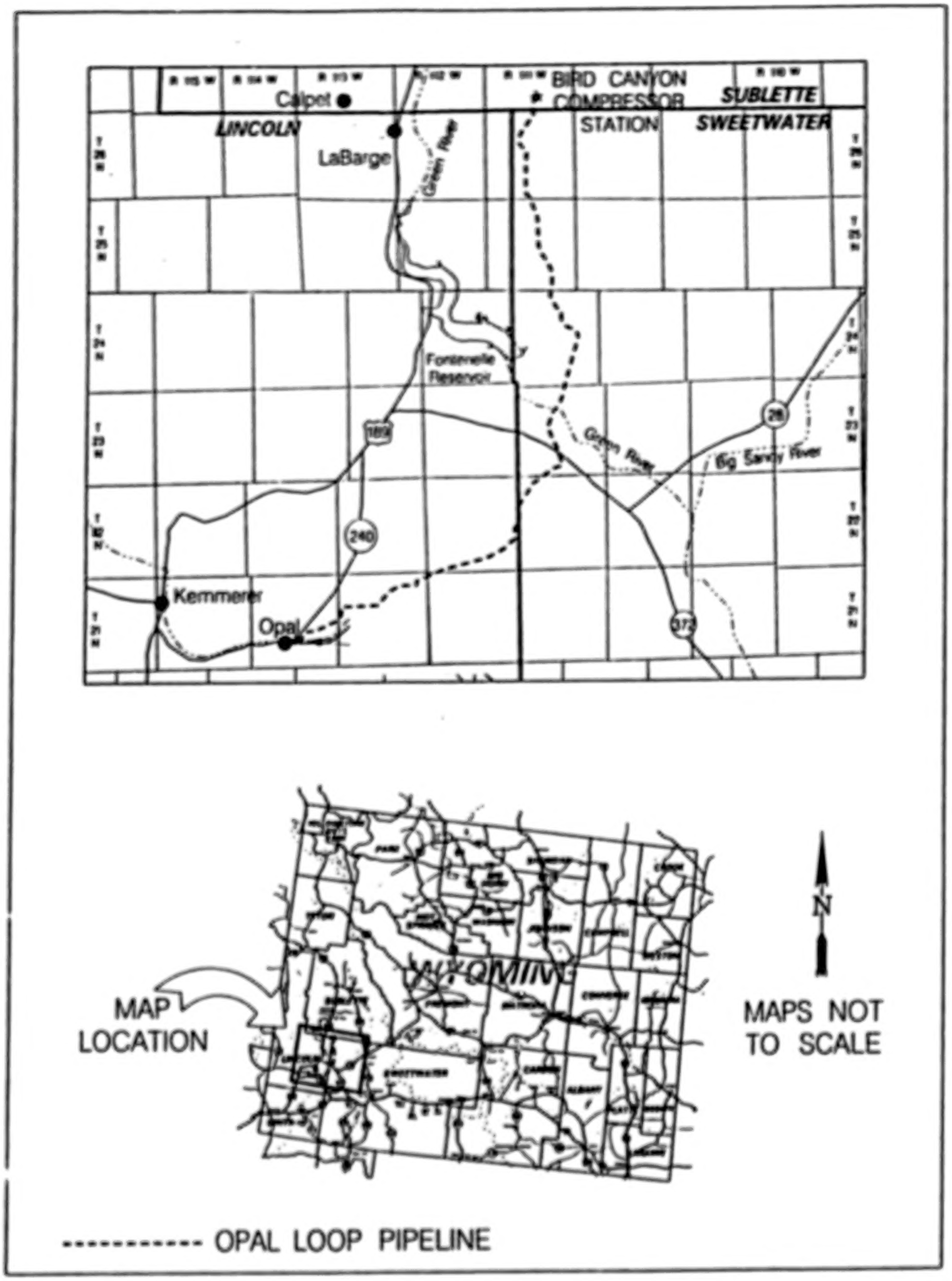

Figure 1-1. General Location Map, Opal Loop Natural Gas Pipeline.

foreign natural gas, primarily from Canada. About 14 percent of this increase in domestic supply is anticipated to come from the Rocky Mountain region. Natural Gas production delivered by the Opal Loop pipeline could help meet this demand.

The purpose of the project would be to allow JGGC to gather natural gas produced from the Jonah and Pinedale Anticline Fields and deliver to multiple markets and provide for the sale of developed federal minerals.

1.3 PURPOSE OF THE ENVIRONMENTAL ANALYSIS PROCESS

The BLM, Rock Springs Field Office, Rock Springs, Wyoming, is the lead agency responsible for preparation of this EA, with resource input and involvement from the BLM, Kemmerer Field Office. The Bureau of Reclamation (BOR), which administers some lands on the proposed pipeline corridor, is a cooperating agency.

The evaluation of this proposal and alternatives was developed through interdisciplinary field review with representatives from JGGC, the BLM, and the project interdisciplinary team (IDT). Also, for purposes of this EA, reference to JGGC, as the project proponent, includes all contractors, subcontractors or other parties that would be involved in the design, layout, and operation of the proposed Opal Loop Pipeline.

The BLM, as authorized by the Council for Environmental Quality (CEQ) and the National Environmental Policy Act (NEPA) directives, analyzes actions involving federal lands to determine their impact on the human environment (40 CFR, Parts 1500-1508). Prior to issuing decisions on the JGCC proposal, the BLM must comply with the requirements of NEPA. NEPA requires Federal agencies to use a systematic, interdisciplinary approach to ensure the integrated use of natural and social sciences in planning and decision making. NEPA also directs that an environmental analysis of proposed Federal actions must be completed to determine reasonable alternatives and effects of the federal action on the environment. The analysis is to determine whether approval of the proposed action would constitute a "major" federal action significantly affecting the human environment. The evaluation of the proposed action and project alternatives was conducted by an interdisciplinary team with representatives from the BLM and a third-party contractor approved by and working under the direction of the BLM.

Factors considered during the environmental analysis process regarding the JGGC project include the following:

- A determination of whether the proposal and alternatives are in conformance with BLM policies, regulations, and approved resource management plan direction.
- A determination of whether the proposal and alternatives are in conformance with policies and regulations of other agencies likely associated with the project.

This EA is not a decision document. It documents the process used to analyze the potential impacts of the proposed action and alternatives and discloses the effects of the proposed action and alternatives to that action. A Decision Record (DR), signed by the responsible official (Field Manager, Bureau of Land Management, Rock Springs Field Office) will document the final decision regarding the selected alternative. The BLM will document whether or not significant impacts would occur with implementation of any of the alternatives. If the BLM determines that no significant impacts would occur, a Finding of No Significant Impact (FONSI) Decision Record would be issued. If significant impacts are identified, the BLM decision would be to complete an EIS, with subsequent

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public input and additional analysis of the alternatives. The BLM decision will relate to BLM administered lands. Decisions by the responsible official regarding the use of transportation networks in the project area by JGGC may affect private land owners, county administration of these roads, and public access to BLM administered lands.

1.4 RELATIONSHIP TO POLICIES, PLANS, AND PROGRAMS

1.4.1 Conformance With Land Use Plan

The proposed pipeline and related facilities are located on lands administered by the Rock Springs and Kemmerer Field Offices. The documents that direct management of BLM administered lands within the project area are the Green River Resource Management Plan (GRRMP)(approved August 8, 1997), and the Kemmerer Resource Management Plan (KRMP)(approved April 29, 1986). The RMPs provide for land use guidance for development of oil and gas reserves, including transmission of products to distribution points by pipelines. The proposed pipeline project is in conformance with the RMPs. The environmental analysis completed for this project will incorporate appropriate decisions, terms, and conditions of use described in the RMP decisions.

1.4.2 Relationship to Other Plans and Documents

The proposed action would comply with all relevant federal, state, and local laws, and the Sublette, Sweetwater, and Lincoln Counties land use plans.

Environmental Assessment and Finding of No Significant Impact for the Bird Canyon-Opal Pipeline, Granger Spur Pipelines, and One Compressor Station, Sublette, Sweetwater, and Lincoln Counties, Wyoming - The BLM has prepared an environmental assessment and issued a Finding of No Significant Impact/Decision Record (FONSI/DR, February 2, 1999) for the Bird Canyon to Opal pipeline route. The FONSI/DR authorized Jonah Gas Gathering Company to construct and operate the proposed Bird Canyon Pipeline, subject to conditions of approval provided in the BLM right-of-way grant. Where appropriate, the Opal Loop Pipeline EA will tier to resource inventories and management direction provided in the Bird Canyon EA.

1.5 ISSUES AND CONCERNS

Public issues and comments regarding the JGGC Opal Loop Pipeline proposal were solicited for incorporation into this EA through the scoping process. A Scoping Statement that described the actions to be analyzed was prepared and submitted to the public on April 13, 2001. The statement identified preliminary land and resource management issues, concerns, and opportunities, and outlined timing needs for public involvement. Environmental and social issues of local importance associated with natural gas production were identified as follows:

- potential impacts to both hunting and non-hunting recreational opportunities;
- potential long-term loss of mature vegetation;
- potential impacts to surface and ground water resources, especially sedimentation impacts at the pipeline crossings of the Green River;
- potential impacts to wild horse habitat in the Little Colorado Desert Wild Horse Herd Management Area;

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- potential impacts to cultural resources, such as archeological sites and historic trails;
- potential for significant paleontological discoveries;
- potential seismic impacts on proposed pipelines and facilities;
- presence of unstable soils and windblown deposits;
- potential for underground subsidence;
- potential impacts to air quality and related values;
- potential adverse impact to threatened and endangered plant species;
- potential for noise impacts;
- potential conflicts with livestock and range improvements;
- cumulative impacts of the proposed project and other ongoing or planned energy-related activities in the general vicinity; and
- potential for delays in pipeline construction.

1.6 AUTHORIZING ACTIONS

The proposed federal, state, county, and local actions required to implement the Opal Loop Pipeline Project are listed in Table 1-1.

Table 1-1. Federal, State, and County Authorizing Actions.

Agency	Nature of Action
DEPARTMENT OF THE INTERIOR	
Bureau of Land Management (Rock Springs and Kemmerer Field Offices	NEPA compliance and approval of ROW applications for pipelines; temporary use permits.
U.S. Fish and Wildlife Service	Review impacts on federally listed or proposed for listing, threatened or endangered species of fish, wildlife, and plants.
DEPARTMENT OF THE ARMY	
U.S. Army Corps of Engineers	Issue permits(s)(Section 404) for placement of dredged or fill material in or excavation of waters of the U.S. and their adjacent wetlands; permit to cross the Green River.

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY	
Water Quality Division	National Pollution Discharge Elimination System (NPDES) permit. Conformance with all surface water standards; permit to construct and permit to operate.
Air Quality Division	Air quality permits for compressor station.
WYOMING STATE ENGINEER'S OFFICE	
	Issue permits to appropriate groundwater and surface water. Issue temporary water rights for construction permits to appropriate surface water.
WYOMING STATE HISTORIC PRESERVATION OFFICE	
	Consultation concerning identification, evaluation, assessments effect and treatment of adverse effects on historic properties.
SUBLETTE/SWEETWATER/LINCOLN COUNTIES	
	Zoning certificates for site development and construction. Small wastewater system permits, where applicable. Road use agreements and/or oversize trip permits when traffic on county roads exceeds established size and weight limits or where the potential for excessive road damage exists. Construction and conditional use permits for all new structures. Zoning changes where applicable. Control of noxious weeds. Permits to bore or trench county roads or for any crossing or access off a county road.
WYOMING DEPARTMENT OF TRANSPORTATION	
	Conformance with applicable size and weight limits for trucks.

CHAPTER 2

PROPOSED ACTION AND ALTERNATIVES

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CHAPTER 2

PROPOSED ACTION AND ALTERNATIVES

2.0 SUMMARY

Jonah Gas Gathering Company (JGGC) proposes to construct a 20-inch dehydrated natural gas pipeline and related facilities (including valves, metering equipment, and compressors). The proposed pipeline would begin at the Jonah Gas Hub in the NENW, Section 34, Township 27 North, Range 111 West. JGGC currently owns and operates a 20-inch pipeline known as the Bird Canyon Pipeline. The proposed pipeline route would parallel the existing JGGC Bird Canyon Pipeline for its entire length from Bird Canyon to the Williams Opal Gas Plant (Figure 1-1). The proposed 20-inch pipeline is approximately 265,590 feet in total length (50.3 miles); approximately 219,827 feet (82.8%) is located on federal land, approximately 4,570 feet (1.7%) on state land, and approximately 41,193 feet (15.5%) on private land. Approximately 5,000 feet (1.9%) of pipeline proposed on federal land is under the administrative jurisdiction of the Bureau of Reclamation

The proposed new pipeline would stay to the west and north of the existing Bird Canyon Pipeline at a minimum distance of 25 feet from the centerline of the existing pipeline. The pipeline route would require a crossing of the Green River. JGGC is proposing to horizontally bore under the Green River to minimize environmental impact. A staging area approximately 500 feet x 200 feet is proposed for each side of the Green River crossing. The pipeline would be buried at least 2.5 feet deep, except at road crossings where the depth would be 6.0 feet. An 80-foot wide construction corridor is proposed by JGGC. Upon completion of the project, a permanent 50-foot wide right-of-way, containing approximately 252.3 federal acres, is proposed for operational and maintenance purposes. The pipeline would be fully operational year-round. The volume of natural gas in the pipeline would be approximately 300-400 million standard cubic feet per day (MMSCF/D). The length of term for the right-of-way requested by JGGC is thirty years.

The compression facility would be co-located with the existing Bird Canyon Compressor Station at the Jonah Gas Hub, located in NENW Section 34, T27N, R111W, in Sublette County, Wyoming. The compressor site would consist of three (3) 3,000 horsepower engine-driven reciprocating compressors (9,000 total horsepower). The new compression would be sited on the existing Bird Canyon Compressor site. New compression and the existing compressor would occupy an area approximately 250 feet in width by 800 feet in length (approximately 4.6 acres).

2.1 PROPOSED ACTION

2.1.1 Design and Construction

A flagged survey has been established along the proposed route. The pipeline would run parallel to the existing Jonah Gas pipeline route from Bird Canyon to the Green River crossing. (Figure 1-1 A minimum distance of 25 feet from the centerline of existing pipelines would be maintained at all times. The JGGC pipeline would stay to the west of Jonah Gas' existing route up to the tie in the Jonah Gas pipeline to Opal.

All pipeline plans and specifications, alignment maps, utility and road profiles, cross sections, site-specific details, and design drawings associated with the project would be available for review at JGGC's office in Pinedale and the BLM Field Offices in Kemmerer and Rock Springs prior to issuance of the ROW grant. The design, engineering, maintenance, and inspection of the proposed pipelines would be performed by JGGC personnel or their contractors in accordance with safe and proven engineering practices.

Construction would begin upon BLM authorization. JGGC personnel would oversee construction by the contractor. Pipeline construction is expected to take approximately 75 days. JGGC would notify BLM at least 5 days prior to the anticipated start of construction and/ or surface-disturbing activities.

JGGC does not propose to do construction or routine maintenance activities during periods when the soil is too wet to adequately support construction equipment or when watershed damage is likely to occur. If such equipment creates ruts in excess of four inches deep, the soil would be considered too wet to adequately support construction equipment. Frozen soil or soil mixed with snow would not be used in construction.

The top 6 inches of topsoil would be removed and conserved during excavation and reused as cover on disturbed areas to facilitate regrowth of vegetation. If the pipeline ROW is granted at a time when winter conditions exist, the following construction options would be considered by JGGC:

Option 1: Sagebrush would be cleared over the entire width of right-of-way with a brush beater. The right-of-way surface would be allowed to thaw, and melted topsoil would be scraped to side of right-of-way utilizing a dozer and/or blade. The scraping and thawing process would be continued until six inches of topsoil has been removed.

Option 2: Sagebrush would be cleared over the entire width of right-of-way with a brush beater. The top six inches of topsoil would be milled using a rotomill. Milled soil would be scraped to the side of the right-of-way. The 80-foot construction corridor would be cleared of above ground vegetation, obstacles, and 6 inches of topsoil, except in flagged areas of cultural significance where no topsoil would be removed. In areas of steep terrain, cuts, gullies, or stream crossings, some blading may be necessary to provide a safe and suitable working area.

After the ROW is cleared and graded, a trench 2-feet wide would be dug with a trencher or, in rocky areas or where the pipeline changes direction, with a backhoe (Figure 2-1). The proposed pipeline would be placed at depths of 3.5-4.5 feet, except at road crossings, where the depth would be 6 feet. Spoil and topsoil would be windrowed separately along the nonworking side of the trench.

Portions of the trench would be open for no more than 10 days, and gaps in the trench would be spaced at intervals of no more than 1.0 mile to allow for the passage of vehicles, livestock, and wildlife. Open trenches would be inspected daily for trapped livestock or wildlife, and JGGC would notify appropriate livestock permittees when trenching would occur in their allotments.

The proposed pipeline would consist of 20 inch, 0.333 inch wall thickness, Grade X-60, MAOP of 1440 psig. Pipe and other construction materials would be hauled to the job by truck, as needed, and stored along the ROW. A bending machine would be used to bend the pipe to fit the trench. Sections of pipe would be lined, welded together, coated with epoxy, and cathodically protected to prevent corrosion according to industry standards. Side-boom caterpillars would then be used to lower the pipe into the trench. In rocky areas, the trench would be padded with sand or soil using a ditch-padding machine.

The pipeline would be pressure-tested with water after the trenches are backfilled. The pipeline would be filled with water and pressurized to 1.25 times their designated operating pressure for 8 hours to verify integrity. Test water would be pumped from the Green River, and permits or license agreements for the withdrawal would be obtained from the Wyoming State Engineer's Office and the BOR. JGGC would use approximately 900,000 gallons (2.68 acre-feet) of water for testing the Opal Loop pipeline. Water would be pumped into a 7 to 10-mile section of pipe, pressurized, and released

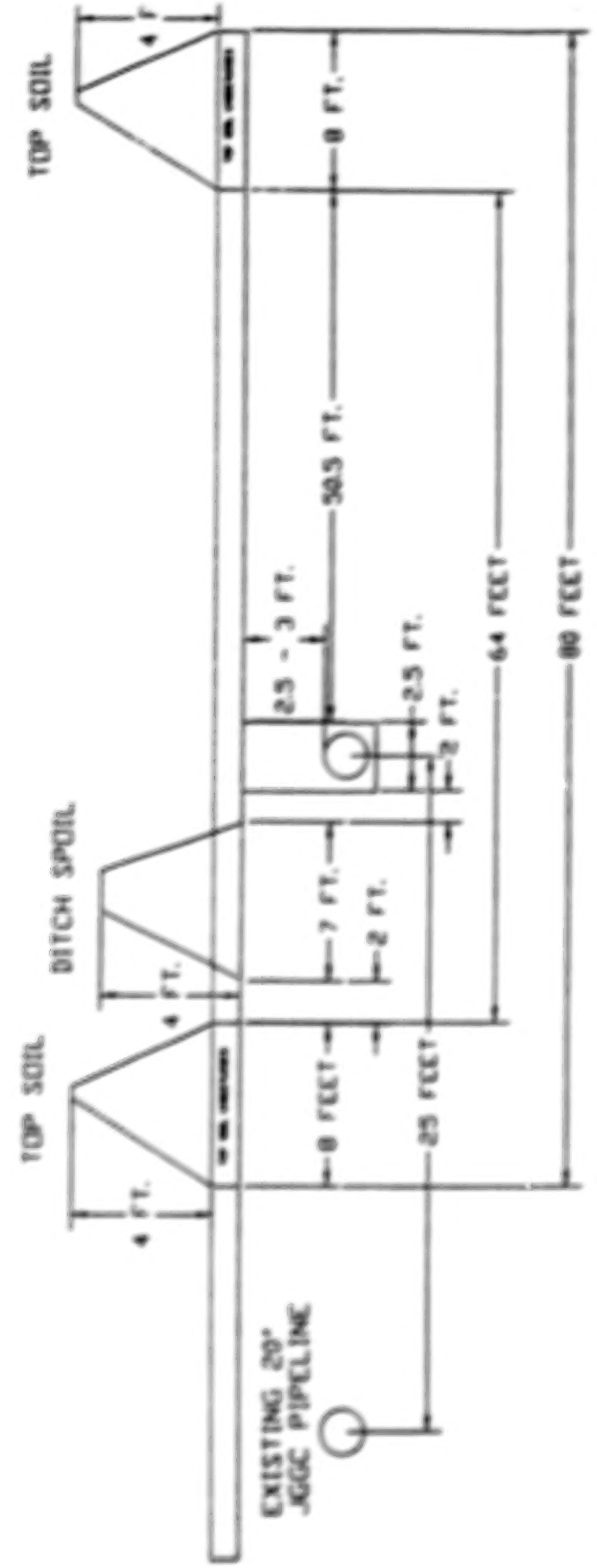

Figure 2-1. Schematic of Pipeline Installation.

to the next 7 to 10-mile section. This procedure would be repeated for the entire pipeline length. Prior to release, hydrostatic test water would be tested and processed, if necessary, to ensure that it meets local, state, and federal water quality standards. All hydrostatic water testing and discharge would be approved in writing by the Wyoming Department of Environmental Quality/Water Quality Division (WDEQ/WQD). Before discharging any hydrostatic test water from the pipeline, workers would protect natural channels within the affected watershed by installing suitable energy dissipaters at pipeline outlets. To prevent scouring or erosion, JGGC would put in place channel protection materials such as filter bags, sandbags or rock. Upon completion of testing, JGGC would remove all installed materials and objects from the site.

After the pipeline is placed, the trench would be backfilled using an angle dozer or auger and the soil would be compacted to prevent subsidence. Any excavated material that cannot be placed in the trench would be disposed of in conformance with applicable landowner or agency requirements. After construction, no berms would remain on the surface, and no rock foreign to the surface would remain exposed. Hydrotesting of the pipeline takes place after backfilling of all the trench except at the final tie-in locations, which are used to separate the hydrotest sections.

At the Green River crossing, specialized horizontal directional drilling construction equipment would be utilized. Typical construction site arrangements for rig side workspace and pipe side workspace are shown on Figure 2-2. A pilot hole of about 4 inches in diameter would be drilled from the rig side to the pipe side (Figure 2-3). Sophisticated guidance equipment would be utilized to assure proper alignment of the pilot hole. Drill cuttings would be stored on each side of the bore in portable water tanks and would be properly disposed of upon completion of the bore. Once the pilot emerges on the pipe side of the bore, reamers of sequentially larger sizes would be utilized until the bore size of the pipe is achieved (24 inches for the 20 inch pipe at the Green River crossing). The bore would have 15 to 20 vertical feet of undisturbed earth between the bore and the river bed to preclude disturbing the river' s flow. In the mean time, welders would be preparing approximately 1000 feet of pipe for installation in the bore. The pipe would be hydrostatically tested before it is pulled under the Green River. The pipe would be pulled by the drilling rig from the pipe side to the rig side. The current plan calls for an 830 foot bore length.

After pipeline construction is completed, markers would be installed at line-of-sight intervals and at road crossings to identify the pipeline's location within the ROW.

No material or borrow sites are anticipated to be necessary for pipeline construction. Approximately 806,400 gallons (2.5 acre-feet) of water for dust control would be obtained from the Green River. Permits or license agreements for water would be obtained from the Wyoming State Engineer's Office and the BOR. The total water required for JGGC actions would be 5.2 acre-feet.

All equipment and vehicular access to the pipeline project would be confined to existing roads and established ROWs. No reconstruction or rerouting of roads would occur.

Equipment used to construct the proposed pipelines would include trenchers, tractor trailers, 2-ton trucks, pickup trucks, trenchers, ditch-padding machines, seed drillers, tractors, backhoes, trackhoes, side-boom caterpillars, and welding trucks.

2.1.2 JGGC Compressor Station

The compression facility would be co-located with the existing Bird Canyon Compressor Station at the Jonah Gas Hub, located in NENW Section 34, T27N, R111W, in Sublette County, Wyoming (Figure 2-4). The compressor station would accept natural gas at approximately 900 pounds per square inch (psi) at the inlet piping, separate liquids using a two-phase separator, discharge the

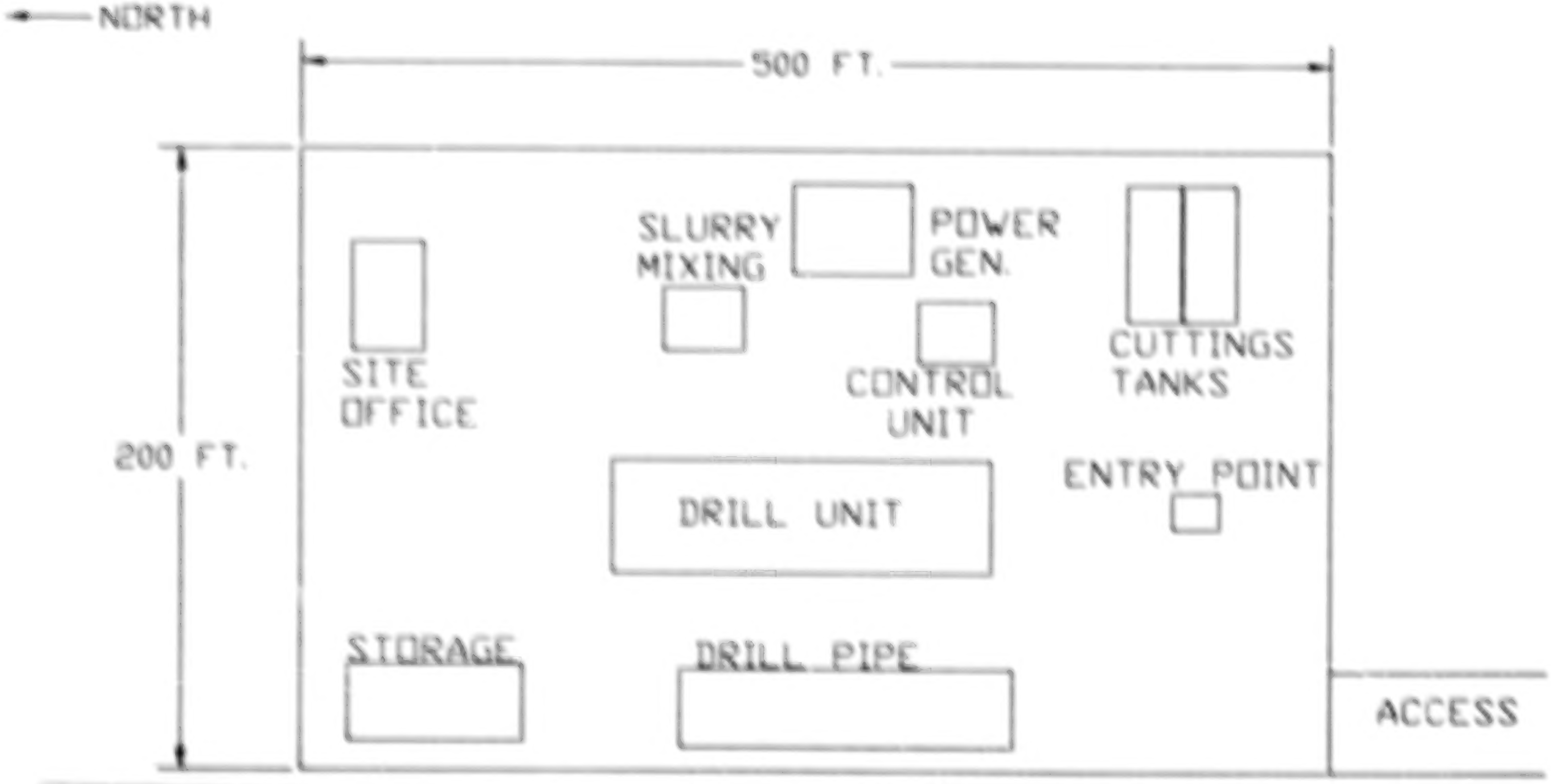

Figure 2-3. Green River Bore Site - Rig (North) Side Work Space.

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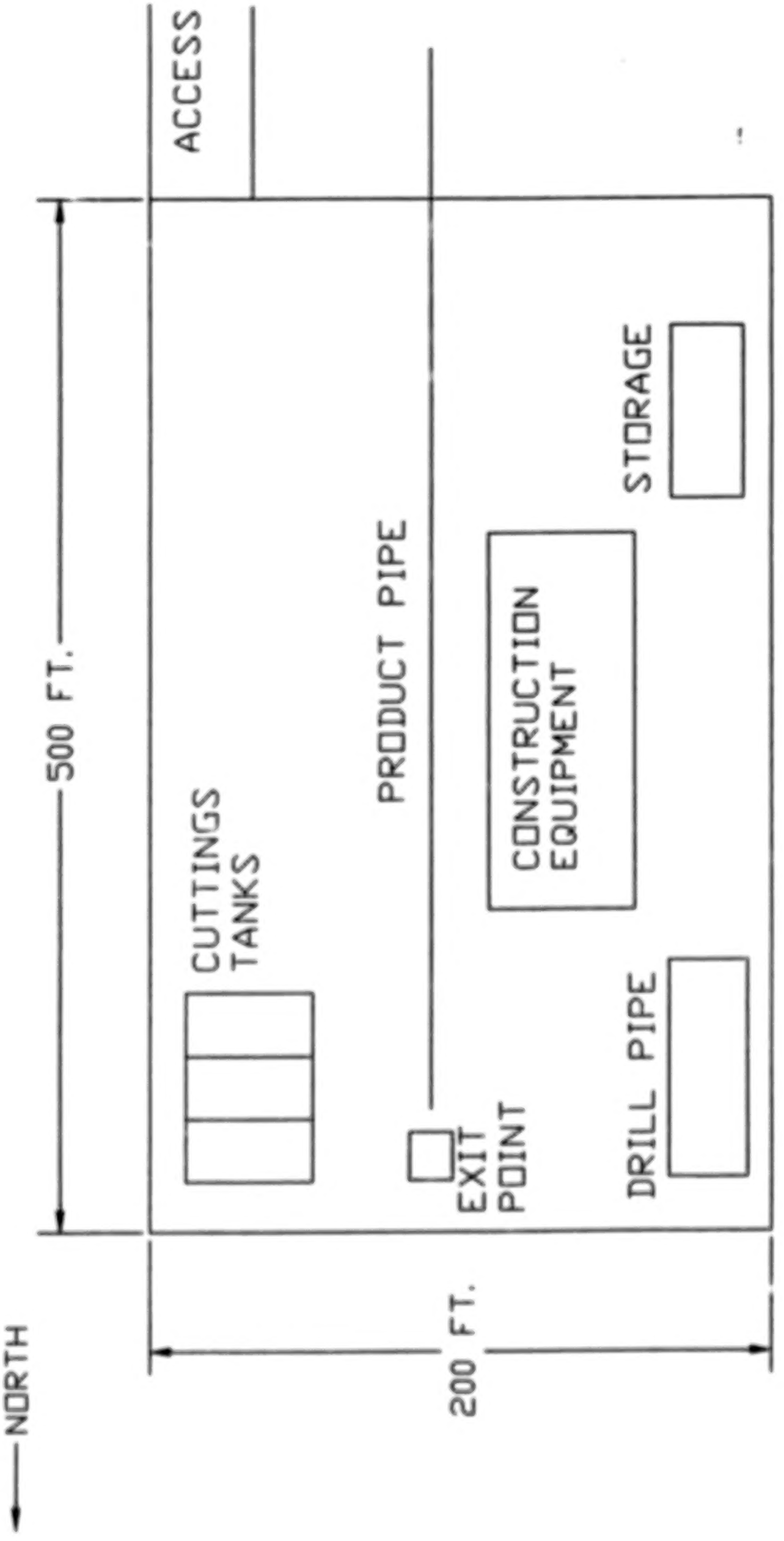

Figure 2-3. Green River Bore Site - Pipe (South) Side Work Space.

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natural gas at approximately 1300 psi, and cool the gas prior to discharge with electric fan coolers driven by a generator. Condensate would be stored on-site in tanks equipped with a combustion chamber to control tank flashing and would be trucked off-site periodically. Approximately 9000 horsepower (hp) of compression would be installed. Equipment would consist of three Caterpillar 3612LE 2935 hp compressor engines equipped with oxidization catalysts, three 400 barrel (bbl) oil tanks, one 300 bbl/day two-phase separator, and one JW Williams combustion chamber with 250 a mcf/day capacity. The proposed equipment would be contained in a fenced area approximately 800 feet by 200 feet (approximately 4.6 acres) located adjacent to an existing county road. New construction would take place inside the fence of the existing Bird Canyon Compressor Station, with no new disturbance.

Line scrubbers would be placed on the suction side of compressors to separate condensed liquids from the gas stream. The scrubber system would include large diameter (48- to 72-inch) horizontal line separators, compressor skid inlet scrubbers, and fuel gas scrubbers, which would discharge into the 400-bbl tanks. About 0.5 bbl of condensate would be recovered for every million cubic feet of gas that flows through the scrubber system.

JGGC workers and contractors would implement all appropriate safety measures in the design, construction, operation, and maintenance of the compressor station.

JGGC would have inspectors present during the construction of the facility. Construction of the compressor station is anticipated to be completed within 90 days. Compressor engine modules would be prefabricated and assembled off-site, then transported to the station by truck and placed on concrete pads. Associated piping would be fabricated and attached to facilitate gas flow.

2.1.3 Operation and Maintenance

2.1.3.1 Pipeline

Prior to utilizing the pipeline, JGGC would submit to the BLM authorized officer (AO) a certificate of construction verifying that their pipeline has been constructed and tested in accordance with the terms of the ROW grant and in compliance with the plans and specifications and all applicable federal and state laws and regulations. (The BLM AOs for this project would be the Rock Springs and Kemmerer Field Managers.)

JGGC would routinely patrol and inspect the pipeline to check for problems such as erosion, pipe exposure, ROW conditions, unauthorized encroachment on the ROW, and any other situations that may result in a safety hazard or may require preventive maintenance. These inspections would be conducted on foot or from a vehicle along existing roads. Vehicles would not traverse pipeline ROWs without prior permission from the BLM. If damage should occur to pipes from external sources, repair or replacement of the portion of the pipeline would be completed. JGGC has developed line break and emergency procedures which would be implemented in the unlikely event of an emergency. These procedures are available for review at the JGGC office in Pinedale.

2.1.3.2 Compressor Station

The compressor station co-located to the Bird Compressor Station would accept natural gas from the inlet pipeline at 850 psi and discharge at 1,380 psi. JGGC employees would operate, maintain, and monitor the station using remote monitoring and alarm equipment. Flare stacks would be continuously operated, piloted, and monitored following the WDEQ Air Quality Division's (WDEQ/AQD's) requirements and industry technology.

Non-Selective Catalytic Reduction (NSCR) systems, air/fuel ratio controllers, and an enclosed combustion chamber would be utilized to reduce emissions of NOx, carbon monoxide (CO), and VOCs from the engine exhaust stacks. NOx, CO, and VOC reduction would be equal to or greater than 98%, 95%, and 85%, respectively.

Total emissions from the Bird Canyon Compressor Station are discussed in Section 4.2 (Air Quality) of this EA.

2.1.4 Reclamation

Operators would scarify, grade, and contour all disturbed areas to preconstruction conditions. Topsoil would be evenly spread and disturbed areas would be revegetated to blend with the surrounding terrain. Reclamation would be accomplished as soon as possible after disturbance occurs. Appropriate measures would be taken to prevent erosion through the use of construction diversion terraces, rip-rap, matting, and water bars. Water bars would be placed approximately every 25 feet on steep slopes to prevent erosion. Any drainages encountered during construction would be cleared of dirt and debris and backsloped as closely as possible to their original contours.

All disturbed areas along the pipeline corridor would be reseeded to landowner or regulatory agency specifications. JGGC would use the application rates and seed mixtures for upland areas, saline lowlands, and other lowland sites (Table 2.2) as recommended in the ROD for the Expanded Moxa Arch Area Natural Gas Development Project EIS (BLM 1997b). Seeding would take place during the spring or late fall when the ground is not frozen. In suitable areas, seed would be planted using a drill equipped with a depth regulator to ensure proper depth of planting. The seed mixture would be evenly and uniformly planted over the disturbed area. Areas not appropriate for drilling, such as steep slopes, would be broadcast-seeded and raked or chained to cover the seed. Seeding rates for broadcast-seeded areas would be double that used in drill-seeded areas. Seeding would be repeated until a satisfactory stand is established as determined by the BLM AO. Evaluation of growth would not be made before completion of the first growing season after seeding.

JGGC would be responsible for weed control on the disturbed areas within the limits of their ROWs and would consult with the AO and/or local authorities for acceptable weed control methods.

JGGC proposes to conduct operations on BLM and Bureau of Reclamation administered lands as follows:

- Certified weed-free seed would be used during re-seeding of disturbed areas.
- Native plant species would be used in reseeding.
- Noxious weed control would be conducted for the life of the project (30 years).
- Monitoring noxious weeds and success of planting would be done.
- All compacted areas would be be ripped to the necessary depth to reduce compaction prior to seeding.
- The minimum surface disturbance required to install the pipe would occur.

2.1.5 Abandonment

At the end of the useful life of the pipelines, JGGC would obtain necessary authorizations from the BLM to abandon the facilities. JGGC would contact the AO to arrange a pre-termination conference and a joint inspection of the ROW to agree on an acceptable abandonment plan.

Pipeline abandonment would be accomplished in accordance with the policies and standards employed by BLM at the time of abandonment. The pipeline would be purged of all combustible materials and retired in place. Operators would remove all aboveground facilities and dispose of unsalvageable materials at authorized sites. Regrading and revegetation of disturbed areas, as applicable, would be completed according to BLM or landowner standards, and the abandoned ROW would revert to the control of the landowner .

2.1.6 Work Force

Pipeline and compressor station construction would require up to 80 JGGC workers at the peak of construction. Construction workers would be hired from the local southwestern Wyoming work force, and no temporary work camps are proposed.

2.1.7 Hazardous Materials

Hazardous and extremely hazardous materials identified in the Environmental Protection Agency's (EPA's) *Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act of 1986* (SARA) and 40 CFR 355 that may be used on the proposed project are presented in Appendix A.

All measures necessary and appropriate for the prevention and containment of accidental discharges would be taken. Refueling of machinery and fuel storage would not be allowed within 500 feet of a perennial, intermittent, or ephemeral stream channel.

To conform with state and federal regulations, any used or unused engine oil or other lubricants would be stored in appropriate labeled containers and disposed of at an approved site. These lubricants would not be stored within 500 ft of a perennial or ephemeral stream.

JGGC would conform with provisions of the *Toxic Substances Control Act of 1976*, as amended (15 United States Code [USC] 2601, et seq.) with regard to any toxic substances that are used, generated by, or stored on the ROW or on facilities authorized under ROW grants (see 40 CFR 702-799 and especially provisions on polychlorinated biphenyl-- 40 CFR 761.1-761.193). Any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity as established by 40 CFR 117.3 would be reported as required by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, Section 102 B. Copies of reports required by federal or state agencies for a release or spill of any hazardous material would be furnished to the AO within 5 working days of occurrence.

JGGC agrees to indemnify the U .S. against any liability arising from the release of any hazardous substance or hazardous waste (as defined in the *Comprehensive Environmental Response, Compensation and Liability Act of 1980*, 42 USC 9601 et seq., or the *Resource Conservation and Recovery Act of 1976* [RCRA], 42 USC 6901 et seq.) on their respective ROW /TUPs, unless the release or threatened release is wholly unrelated to JGGC activities on the ROW /TUP .This agreement is applied without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

Regarding herbicide use, JGGC would comply with all federal and state laws and with registered uses and limitations imposed by the AO. Before using herbicides, JGGC would obtain written approval from the AO of a plan showing the type and quantity of material used, pest(s) to be controlled, application methods, storage locations, container disposal, and any other information deemed necessary by the AO.

2.1.8 Applicant-committed Practices

2.1.8.1 Survey Monuments

JGGC would protect all survey monuments, witness corners, reference monuments, and bearing trees within the ROW against disturbance during construction, operation, maintenance, and rehabilitation. If any monument, corner, or accessory is destroyed, obliterated, or damaged, JGGC would arrange for a registered land surveyor to restore the disturbed monument, corner, or accessory using surveying procedures specified in the *Manual of Surveying Instruction for the Survey of Public Lands of the United States*, 1973 edition. JGGC would record the survey in the appropriate county and send a copy to the appropriate BLM office.

2.1.8.2 Fire Control

JGGC would notify the AO of any fires during construction and would comply with all rules and regulations administered by the AO concerning the use, prevention, and suppression of fires on federal lands.

In the event of a fire, JGGC or their contractors would initiate fire suppression actions in the work area. Suppression would continue until the fire is out or until the crew is relieved by an authorized representative of the agency on whose land the fire occurred. Heavy equipment would not be used for fire suppression outside the ROW without prior approval of the AO unless there is imminent danger to life or property. JGGC or their contractors would be responsible for all costs associated with the suppression of fires and the rehabilitation of fire damage resulting from their operations, employees, or contractors.

JGGC would designate a representative to be in charge of fire control during pipeline construction. The fire representative would ensure that each construction crew has fire fighting tools and equipment, such as extinguishers, shovels, and axes, available at all times. The number of tools needed would depend on the number of persons working in the area. JGGC would, at all times during construction, maintenance, and operations, require that satisfactory spark arresters be maintained on internal combustion engines.

2.1.8.3 Cultural Resources

Class III surveys have been completed on the area proposed for surface disturbance and reports were submitted to the BLM Rock Springs and Kemmerer Field Offices. JGGC and contractors would inform their employees about relevant federal regulations protecting cultural resources. If any cultural remains, monument sites, objects, or antiquities subject to the *Antiquities Act of June 8, 1906* or the *Archaeological Resources Protection Act of 1979* are discovered during construction, activities shall immediately cease and the responsible AO would be notified.

2.1.8.4 Paleontological Resources

If paleontological resources are uncovered during construction activities, JGGC or their contractors would suspend all operations to prevent further disturbance of such materials and would immediately contact the BLM's AO, who would arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan. Mitigation of paleontological resources would occur on a case-by-case basis, and JGGC would be responsible for the costs.

2.1.8.5 Air Quality/Noise

All vehicles and construction equipment would be maintained to minimize exhaust emissions and would be properly muffled to minimize noise. Disturbed areas would be watered as necessary to suppress dust. Noise from construction activities would be of short duration.

JGGC would utilize low-emission (0.7 grams NOx/hp-hour) compressor engines at the proposed compressor station. Furthermore, a 98% efficient, smokeless, flare stack would be used to control VOC emissions from tanks. Compressor engines would emit a constant loud noise (approximately 65 dBA (" A"-weighted decibels] on-site and 40 dBA at 0.25 mile) for the LOP.

2.1.8.6 River and Wetland Crossings

JGGC would bore under the Green River and associated wetlands, avoiding surface disturbance. Borings would be located far enough away from the stream channels to ensure that bank stability is not jeopardized. JGGC would trench crossings at all other stream crossings and numerous unnamed ephemeral drainages along the pipeline corridor.

Operators would ensure that all fueling, servicing, and staging of vehicles takes place more than 500 feet from any river, stream, or riparian area.

At crossings of rivers and wetlands, JGGC would comply with all U.S.Army Corps of Engineers (COE) Wyoming regulatory Office regulations.

2.1.8.7 Winter Construction Options

If the pipeline ROWs/TUPs are granted and construction occurs when winter conditions exist, the following options would be considered.

Option 1

- Vegetation would be cleared over the entire width of the ROW /TOP with a brush beater.
- ROW /TUP surface would be allowed to thaw, if necessary.
- Thawed topsoil would be scraped to one side of ROW /TOP using a dozer and/ or blade.
- Scraping/thawing processes would be continued until 6 inches of topsoil are removed.

Option 2

- Vegetation would be cleared over the entire width of the ROW /TUP with a brush beater.
- The top six inches of topsoil would be milled using a rotomill. Milled soil would then be scraped to one side of the ROW /TUP .

Option 3

- Other BLM-approved actions to remove 6 inches of topsoil.

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2.1.8.8 Wildlife

JGGC would comply with the following guidelines concerning avoidance of raptor nests and sage grouse leks and nesting areas.

Raptors

Operators would not remove cottonwood trees at the Green River crossing to protect potential raptor nesting and/ or roosting habitat. Operators would bore at the crossing to ensure trees are protected.

Where feasible, pipeline ROWs and TUP areas would be selected and designed to avoid disturbance to raptor nests. If construction activities are to occur between February 1 and July 31, surveys for raptor nests within 0.5 to 1.0 mile of the proposed pipeline routes would be conducted to determine nest occupancy. All construction activities would be restricted between February 1 and July 31 within a 0.5-mile radius of all occupied raptor nests except ferruginous hawk and bald eagle nests, for which the seasonal buffer would be 1.0 mile. Surface structures requiring repeated human presence would not be constructed within 825 feet (2,000 feet for bald eagles) of active raptor nests, where practical. An active raptor nest is defined as a nest that has been occupied within the past 3 years.

Sage Grouse

Surface disturbance within 0.25 mile of any sage grouse lek would be avoided. If construction activities are planned in potential sage grouse nesting habitat (i.e., areas within 2 miles of an active lek) between February 1 and July 31, BLM wildlife biologists would conduct field evaluations to identify active nests or leks, and if an active sage grouse nest is identified in an area proposed for disturbance, construction activities would be delayed until nesting is completed and the young are fledged.

Sensitive Animals and Plants

The BLM would conduct U.S. Fish and Wildlife Service (USFWS) consultation and coordination as necessary for all mitigation activities relating to T&E, candidate species and their habitats. In areas that have not been previously surveyed or cleared for these species, a qualified biologist/botanist would conduct surveys for these species in areas of potential habitat prior to disturbance. If T &E, candidate, or sensitive species are found, consultation with the USFWS would be initiated, as necessary, and construction activities would be curtailed until the BLM, USFWS, and Operators concur on which activities can be authorized.

Proposed construction sites in prairie dog colonies were surveyed in for the JGGC Bird Canyon-Opal Pipeline under the direction of the BLM to determine white-tailed prairie dog colony/complex size and burrow density, and to determine whether criteria for black-footed ferret habitat are met. BLM determined that the few white-tailed prairie dog colonies located along the proposed pipeline route were not of sufficient burrow density to meet criteria for black-footed ferret habitat.

JGGC would conduct site-specific surveys for sensitive plants on uncleared areas as directed by the BLM.

2.1.8.9 Historic Trail Crossings

JGGC would comply with all BLM and State Historic Preservation Office (SHPO) recommendations for crossings of Historic Trails. Trails would be crossed in areas of existing disturbance and no new

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disturbance would occur in undisturbed portions of trails. Historic trail segments would not be used by JGGC or their contractors to access the pipeline ROW.

2.1.8.10 Sanitation

Construction sites would be maintained in a sanitary condition at all times. Waste materials--human waste, trash, garbage, refuse, etc.,would be disposed of promptly at an appropriate waste disposal site. A litter policing program, approved by the AO, would be implemented by JGGC to cover all roads and other sites associated with the pipeline ROW.

2.1.8.11 Existing Utilities

JGGC would secure an ROW on public lands from the BLM prior to pipeline construction and would notify other authorized ROW users of any pipeline crossings or overlaps. Any associated building or zoning on river, creek, or utility crossing permits would be secured from the appropriate regulatory agency or private entity prior to pipeline construction.

2.1.8.12 Visual Resources

JGGC would restore the pipeline ROW to as near its original contour as possible after construction is completed. The ROW would be planted with the seed mixture(s) recommended by JGGC and approved by the BLM. All aboveground facilities would be painted with Carlsbad Canyon 2.5Y 6/2 or similar color determined by the AO to blend with the surrounding landscape.

2.2 ALTERNATIVES

2.2.1 County Line Compressor Site

JGGC has a Compressor Site permitted with the WDEQ -AQD called the County Line Compressor Site. This facility is located across the road from the existing Bird Canyon Compressor Site and the newly proposed co-located Bird Canyon compressor site proposal. JGGC may prefer to select the County Line Compressor site if an air quality permit cannot be obtained from the WDEQ-AQD in a manner that accommodates the JGGC construction schedule. Environmental impacts associated with the County Line Compressor would be similar to those at the Bird Canyon site.

2.2.2 Alternative Pipeline Routes

During development of the Proposed Action, alternative pipeline routes were considered, but the Proposed Action route was determined optimal because they would parallel existing ROWs for most of their lengths, thereby minimizing environmental impact.

2.3.3 No Action Alternative

Under the No Action Alternative, neither the compressor station nor the pipelines would be constructed. No ground would be disturbed, and no impacts to the existing physical or biological environment would take place.

2.3 ALTERNATIVES CONSIDERED BUT NOT FURTHER EVALUATED

JGGC, in concert with the producer group of the Jonah and Pinedale Anticline fields, considered an alternative proposed by Williams Field Services (WFS) in their scoping comment to the BLM (May 10, 2001).

WFS has an extensive natural gas gathering system that serves the greater Green River Basin and the southern portion of the Hoback Basin. The gathering system extends from the Opal Plant in Lincoln County, south and east into Uinta County and north and east into Sublette, Lincoln, and Sweetwater Counties.

WFS states in their May 10, 2001 memo that sufficient capacity is available in the existing WFS 30-inch pipeline from the LaBarge Station to the inlet of the Opal Plant to accommodate the incremental production that is being projected by JGGC with the Opal Loop project. Gathering the JGGC production to the WFS 30-inch pipeline would require the looping of 11 miles of 12-inch and 16-inch pipeline located between Bird Canyon and LaBarge Station with a 24-inch line. The 11 miles of 24-inch loop would parallel the existing WFS pipeline rights-of-way. (See the May 10, 2001 memo to BLM for more detail on the WFS proposal).

The producer group, as a whole, rejected this proposal for the following reasons:

- Gas marketing/delivery options would be limited to WFS' Opal Facility through WFS' 16 and 30 inch gathering lines with the WFS proposal, whereas deliveries could be made directly to a number of gas processors or transporters (e.g. Kern River, CIG, Mountain Gas, OTTCO, Questar) with JGGC's Opal Loop proposal. Thus the WFS proposal does not meet the purpose and needs of JGGC and the producer group for which JGGC gathers gas, while the JGGC proposed action does meet those needs.
- Current projections for volume from the Jonah and Pinedale Anticline gas fields will require gathering of 800 million standard cubic feet per day (MMSCFD). Current volume capability of the 20 inch Bird Canyon Pipeline is 400 MMSCFD. WFS' proposal highlights an incremental volume increase of 250 to 300 MMSCFD. Thus, WFS' proposal would fall short of volume projections by 100 to 150 MMSCFD
- Scheduling of the WFS proposal would not allow additional gas deliveries as early as the JGGC proposal due to equipment deliveries (compression) and the environmental analysis time frame. This would limit delivery volume flexibility of the gas producers.
- Environmental concerns exist with the WFS pipeline route associated with impacts to riparian areas at the proposed Green River crossing.
- A segment of the WFS proposal would be routed through areas of known sensitivity to Native American traditional values.

WFS, in a memo to the BLM dated May 31, 2001 stated that in conversations with representatives of the Jonah Field gas producers, WFS was advised that the producers have elected to support the JGGC proposed action and have opted to contract with JGGC rather than with WFS. WFS stated that in the interest of moving Wyoming production as expediently as possible and to support Kern River's and Northwest Pipeline's efforts to transport gas to California markets, WFS defers to the decision of these producers to support the JGGC proposal.

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CHAPTER 3

AFFECTED ENVIRONMENT

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CHAPTER 3

AFFECTED ENVIRONMENT

3.0 INTRODUCTION

The Affected Environment chapter of this environmental assessment (EA) for the proposed Opal Loop Natural Gas Pipeline project discusses environmental, social, and economic factors as they currently exist within the project area. The material presented here has been guided by management issues identified by the Bureau of Land Management (BLM), Rock Springs and Kemmerer Field Offices; public scoping; by interdisciplinary field analysis of the area; and field data and analysis provided in an environmental analysis completed on the existing Bird-Canyon-Opal Pipeline (Environmental Assessment and Finding of No Significant Impact for the Bird Canyon-Opal Pipeline, Granger Spur Pipelines, and One Compressor Station, Sublette, Sweetwater, and Lincoln Counties, Wyoming, BLM 1999).

This proposal could potentially affect critical elements of the human environment as listed in BLM's National Environmental Policy Act (NEPA) Handbook H-1790-1 (USDI-BLM 1988). This EA discusses potential effects of the project on range resources, air quality, paleontology, soils, water resources, vegetation (including invasive and non-native species) and wetlands, wildlife, special status species, visual resources, noise, recreation, socioeconomics (including environmental justice), cultural resources (including native American religious concerns), and health and safety (including hazardous and solid waste). The resources that are of concern in the project area include: cultural resources, special status plants, air quality, and water quality. The following resource elements, while critical, are not present in the project area and therefore will not be addressed further: prime and unique farmlands, floodplains, wild and scenic rivers, areas of critical environmental concern, and wilderness areas.

3.1 GEOLOGY/MINERALS/PALEONTOLOGY/HAZARDS

3.1.1 Geology

Detailed accounts of geology and mineral resources in the vicinity of the proposed pipeline are presented in Green River Resource Area RMP EIS (BLM 1992, 1996a), Kemmerer RMP EIS (BLM 1985a, 1985b), Fontenelle Natural Gas Infill Drilling Projects EIS (BLM 1995a), and the EIS for the Expanded Moxa Arch Area Natural Gas Development Project (BLM 1995b).

3.1.2 Minerals

The proposed pipeline route lies within the Green River Basin, part of the Green River Drainage Basin (BLM 1985a). The Green River Basin contains several mineral resource deposits, including the world's largest deposit of trona, but the principal resource extracted from the area is natural gas. North and slightly south of the Green River and south and west of Fontenelle Reservoir, the Laney Member of the Green River Formation dominates the surface geology. Surface geology of the area south of the Green River to Granger is dominated by the Bridger Formation, which formed many badland areas, with small dune sand and terrace gravel inclusions. Alluvium and colluvium deposits along the Green River, Shute Creek, and Seven mile Gulch are the result of glacial melt.

3.1.3 Hazards

The project area has not experienced any major earthquakes within historic times. The U .S. Geological Survey (USGS) estimates that a magnitude 4.2-4.5 earthquake might occur somewhere in the Green River Basin every 62 years (BLM 1996b). Some areas of windblown sand deposits are presently stabilized by vegetation. There are no trona mine shafts within 1 mile of the proposed route; therefore, subsidence is not a concern. No major landslides have been mapped within the Fontenelle Cumulative Impact Study Area or the Moxa Arch Analysis Area, and the nearest active faults with surface expression occur far to the west (BLM 1995a, 1995b).

Because the proposed project would not impact geology, minerals, or geologic hazards or be impacted by geologic hazards, these resources are not further discussed in this document.

3.1.4 Paleontology

Because of the length of the proposed pipeline route and the potential for significant fossil discoveries, a nonfield paleontologic resource evaluation was conducted (EVG 1998).

Paleontologic resources are the remains of prehistoric organisms which have been preserved by natural processes within the earth's crust (BLM 1995b). The fossil record of the Green River Basin is well-documented (BLM 1992; EVG 1998) and suggests a potential for additional discoveries of fossils representing a variety of life forms. In particular, the Bridger Formation and the Laney Member of the Green River Formation have high paleontologic potential, meaning they have produced significant vertebrate, invertebrate, or plant fossils. The Bridger Formation is rich in mammal fossils and has also produced fossil turtles, freshwater mollusks, leaves, fish, crocodiles, and birds (BLM 1992). The Laney Member has produced a variety of fish fossils (BLM 1995a). A detailed account of the geology and paleontological potential of the Bridger Formation and Laney Member are presented in EVG (1998).

3.2 CLIMATE AND AIR QUALITY

3.2.1 Climate

The pipeline project area is located in a continental dry, cold-temperate-boreal climate (Trewartha 1968), which has limited rainfall and long, cold winters. Meteorological measurements collected at La Barge, Wyoming (1958-present), approximately 9 miles west of the project area, indicate that the annual average total precipitation for the area is 8.3 inches, ranging from 3.4 inches (1975) to 17.8 inches (1995). Precipitation is greatest from late spring to early fall, with the peak monthly average of 1.35 inches occurring in May. An average of 30.9 inches of snow falls during the year (annual high 43.6 inches in 1987), with heaviest monthly snowfalls occurring in December and January. Table 3-1 shows the mean monthly temperature ranges and average precipitation amounts.

Temperatures are generally cooler, frost-free periods shorter, and both precipitation and snowfall greater at higher elevations. The region is typically cool, with average daily temperatures (in degrees Fahrenheit; °F) ranging between –1 °F (low) and 32 °F (high) in mid winter and between 42 °F (low) and 79 °F (high) in mid summer. Extreme temperatures have ranged from –52 °F (occurring in 1990) to 95 °F (occurring in 1973). The frost-free period (above 32 °F) generally occurs from early June to mid-September.

The project area is subject to strong and gusty winds, reflecting channeling and mountain valley flows due to complex terrain. During the winter months strong winds are often accompanied by

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snow, producing blizzard conditions and drifting snow. The closest comprehensive wind measurements are collected by Amoco Corporation in the Jonah Field, approximately 40 miles southeast of Pinedale, Wyoming in Sublette County. Figure 3-1 shows the relative frequency of winds, with radial distributions by speed class, indicating the direction of the wind source. From this information, it is evident that the winds originate from the northwest nearly 40 percent of the time. The annual mean wind speed is nearly 12 mph.

Table 3-1. La Barge, Wyoming, 1958-Present Mean Monthly Temperature Ranges and Average Precipitation Amounts.

Month	Average Temperature Range (°F)	Average Precipitation (inches)	Average Snowfall (inches)
January	-2 - 31	0.3	6.2
February	1 - 35	0.4	4.4
March	14 - 43	0.4	4.0
April	23 - 54	0.8	2.8
May	32 - 65	1.4	1.3
June	39 - 73	1.1	0.0
July	44 - 83	0.7	0.0
August	42 - 82	0.9	0.0
September	33 - 71	0.8	0.1
October	22 - 59	0.6	1.7
November	11 - 42	0.5	4.3
December	-1 - 31	0.5	6.0
ANNUAL	38.6 (mean)	8.3 (mean)	30.9 (mean)

Source: (WRCC 2001)

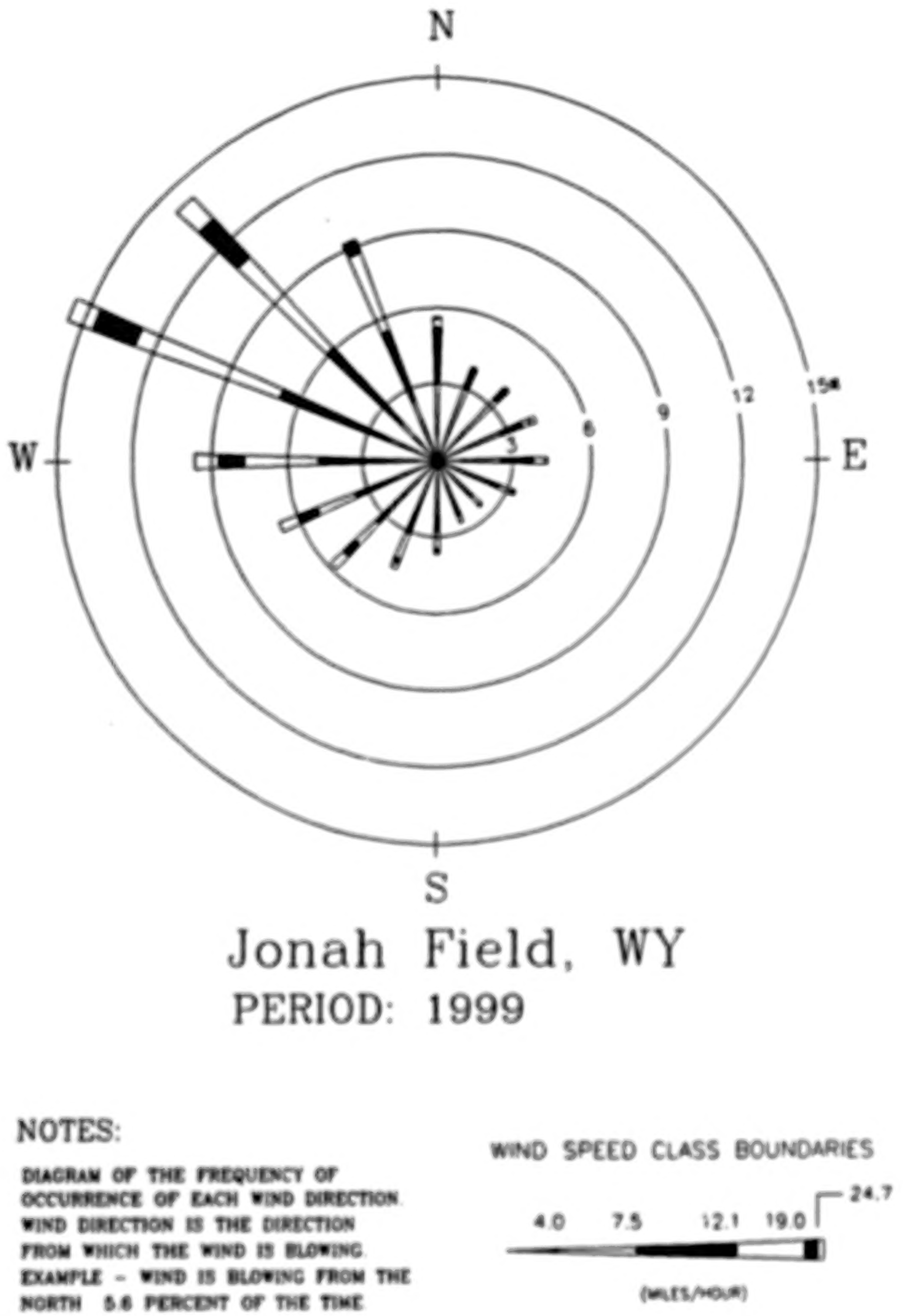
The frequency and strength of the winds greatly affects the dispersion and transport of air pollutants. Because of the strong winds in the project area, the potential for atmospheric dispersion is relatively high (although nighttime cooling will enhance stable air, inhibiting air pollutant mixing and transport).

Tables 3-2 and 3-3 show the frequency distribution of wind speed and atmospheric stability class in the Jonah Field. The atmospheric stability class is the measure of atmospheric turbulence, which directly affects pollutant dispersion. The stability classes are divided into six categories, designated "A" (unstable) through "F" (stable). The "D" (neutral) stability class occurs more than half of the time.

3.2.2 Air Quality

Although specific air quality monitoring is not conducted throughout most of the project area, air quality conditions are likely to be very good, as characterized by limited air pollution emission sources (few industrial facilities and residential emissions in the relatively small communities and isolated ranches) and good atmospheric dispersion conditions, resulting in relatively low air pollutant

Figure 3-1. Wind Rose for the Opal Loop Pipeline Analysis Area.



NOTES:

DIAGRAM OF THE FREQUENCY OF OCCURRENCE OF EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING. EXAMPLE - WIND IS BLOWING FROM THE NORTH 5.6 PERCENT OF THE TIME.

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Table 3-2. Wind Speed Distribution.

Wind Speed (miles/hour)	Percent of Occurrence
0-4.0	7.4
4.0-7.5	26.3
7.5–12.1	29.3
12.1-19.0	23.9
19.0-24.7	7.5
Greater than 24.7	5.5

Table 3-3. Stability Class Distribution.

Stability Class	Percent of Occurrence
A	2.6
B	6.4
C	11.2
D	59.0
E	17.4
F	3.3

concentrations. The Wyoming and National Ambient Air Quality Standards set absolute upper limits for specific air pollutant concentrations at all locations where the public has access. The New Source Review-Prevention of Significant Deterioration (PSD) Program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined "baseline" level (depending on the location's classification). Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict. The Opal Loop Pipeline project area and the surrounding areas are classified as PSD Class II. The two closest PSD Class I areas, the Bridger and Fitzpatrick Wilderness Areas, could be impacted by cumulative project source emissions. These Wilderness areas lie over 45 miles to the northeast of the pipeline project area.

All National Environmental Policy Act (NEPA) analysis comparisons to the PSD Class I and II increments are intended to evaluate a "threshold of concern," and do not represent a regulatory "PSD Increment Consumption Analysis." The determination of PSD increment consumption is an air quality regulatory agency responsibility (with EPA oversight). Such an analysis would be conducted as part of a major New Source Review, including a Federal Land Management Agency's evaluation of potential impacts to Air Quality Related Values (AQRV) such as visibility, aquatic ecosystems, flora, fauna, etc. A "PSD Increment Consumption Analysis" may also be performed by the responsible air quality regulatory agency (or by EPA) in order to determine minor source increment consumption.

While no criteria air pollutant concentration monitoring has occurred in the project area, background values measured in the region are well below established standards. Measured air pollutants include: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, particulate matter less than 10 microns in effective diameter (PM-10), and sulfur dioxide (SO_2). Assumed background air pollutant concentrations, applicable Wyoming and National Ambient Air Quality Standards, and PSD Class I and II increments (measured in micrograms per cubic meter, or $\mu g/m^3$) are provided in Table 3-4.

Table 3-4. Air Pollutant Background Concentrations, State and Federal Ambient Air Quality Standards, and PSD Increments ($\mu g/m^3$).

Pollutant/Averaging Time	Measured Background Concentration	State and National Ambient Air Quality Standards	Incremental Increase Above Legal Baseline PSD Class I	Incremental Increase Above Legal Baseline PSD Class II
Carbon Monoxide (CO)				
1-hour	3,500 a	40,000	n/a	n/a
8-hour	1,500 a	10,000	n/a	n/a
Nitrogen Dioxide (NO_2)				
Annual	10 b	100	2.5	25
Ozone				
1-hour	110 c	235	n/a	n/a
Particulate Matter (PM-10)				
24-hour	45 d	150	8	30
Annual	13 d	50	4	17
Sulfur Dioxide (SO_2)				
3-hour (National)	132 e	1,300	25	512
24-hour (National)	43 e	365	5	91
24-hour (Wyoming)	43 e	260	n/a	n/a
Annual (National)	9 e	80	2	20
Annual (Wyoming)	9 e	60	n/a	n/a

Note: Measured background ozone concentration data is top tenth percentile maximum 1-hour value; other short-term background concentrations are maximum measured values.
n/a not applicable
Wyoming Ambient Standards from: Wyoming Air Quality Standards and Regulations, Chapter 2– Ambient Standards
National Ambient Standards from: 40 CFR Part 50
PSD Increments from: 40 CFR Parts 51 and 52 Prevention of Significant Deterioration for Particulate Matter, EPA Final Rule. Federal Register Vol. 58, No. 105, Thursday, June 3, 1993.

Background Air Quality Data Sources:

a Data collected by the WDEQ-AQD and commercial operators and summarized in the Riley Ridge EIS (BLM, 1983).
b To supplement monitored NO_2 data, separate NO_2 modeling analysis was performed, including many oxides of nitrogen (NO_x) emission sources (BLM 1996).
c Data collected at Pinedale, Wyoming 1993-1994.
d Data collected at Seedskadee National Wildlife Refuge (1989-1995).
e Data collected at LaBarge Study Area at the Northwest Pipeline Craven Creek site (1982-1983).

The background concentration data were obtained from the Jonah II EIS project (BLM, 1998). These data reflect the most recently available air quality monitoring data collected in the vicinity of the Opal Loop Pipeline project area. An estimate of background air quality concentrations is needed to combine with modeled project-related air quality impacts for comparison to applicable air quality standards. It is important that each pollutant's background concentration, model predictions, and air quality standards are all based on the same averaging times.

Continuous visibility-related optical background data were collected at the PSD Class I Bridger Wilderness Area in Wyoming, as part of the Interagency Monitoring of PROtected Visual Environments (IMPROVE) program. Visibility in the Central Rocky Mountains is very good (averaging over 70 miles Standard Visual Range), with fine particle impacts accounting for nearly half of the average degradation (Sisler 1996). In addition, background atmospheric deposition (acid rain) impacts were monitored at the National Acid Deposition Program/National Trends Network sampling station near Pinedale, Wyoming, and site-specific lake chemistry (pH, acid neutralizing capacity, elemental concentrations, etc.) background data have been collected by the U.S. Geological Survey (Water Quality Division) in several high mountain lakes in the wilderness areas.

The WDEQ-AQD is the primary air quality regulatory agency responsible (under their EPA approved State Implementation Plan) for determining potential impacts once detailed development plans have been made, subject to applicable air quality laws, regulations, standards, control measures and management practices. Therefore, the State of Wyoming has the ultimate responsibility for reviewing and permitting Opal Loop Pipeline project air pollutant emission sources before they become operational. Unlike the conceptual "reasonable, but conservative" engineering designs used in this NEPA analysis, the WDEQ-AQD air quality preconstruction permitting would be based on very site-specific, detailed engineering values, available as part of the permit application.

3.3 SOILS

Soils information for this project were derived from the Soils and Water Resources Technical Report for the Moxa Arch Area (BLM 1995d), the Fontenelle Natural Gas Infill Drilling Projects, Sweetwater and Lincoln Counties, Wyoming, Draft EIS (BLM 1995a), the Slate Creek Soil Survey (BLM 1991), and the Soil Survey of Sweetwater County (Natural Resources Conservation Service n.d.).

3.3.1 Northern Terminus (NENW of Section 34, T27N, R111W) to Dodge Rim (SWNW of Section 33, T22N, R111W)

This segment of the pipeline project crosses rolling uplands dominated by soils with hard fractured sandstone, usually within 24 to 36 inches of the surface. Some areas have sandstone gravel to the surface. Sandstone outcrops occur, especially on slope breaks. Swales and drainages between uplands usually have deep soils with no rock fragments above 60 inches. Due to sand content, many of these soils are subject to accelerated wind erosion when vegetation is removed. Topsoil can be salvaged for a depth of 6 to 12 inches, depending on the depth to rock fragments.

Soils in the Green River flood plain usually lack rock fragments near the surface. Topsoil can be salvaged to a depth of at least 12 inches. On the south side of the river, alluvial fans in Sections 21 and 28, T23N, RI11W, off Dodge Rim are dominated by soils with gravels within 12 inches of the surface and are loaded with carbonates. These carbonate-rich soils are usually not cemented, but caliche may appear in some areas.

3.3.2 Opal to Dodge Rim

The segment of the ROW from Opal east to Dodge Rim (SWNW of Section 34, T22N, RIIIW) is characterized by soils found on remnant terraces or mesas dissected by drainages, soils on side slopes and dissected fans, and soils found on saline flood plains.

In general, the remnant terrace soils have gravels and cobbles within 12 to 18 inches of the surface and have high concentrations of carbonates below the surface horizon. This carbonate layer is usually not cemented, although caliche may be found in some areas. Depth to shale or sandstone bedrock is usually below 60 inches. These gravelly calcareous soils dominate Opal Bench and Dodge Rim. Isolated areas of sand dunes are found on these benches. Topsoil depth ranges from 6 to 18 inches, depending on the depth to rock fragments.

The ROW crosses steep slopes with shallow soils surrounding these terraces in the SWSW of Section 18, T21N, RI13W, and the SESW of Section 26, T22N, RI12W, on Opal Bench and the SENE of Section 6, T22N, R111W, on Dodge Rim. These steep slopes, which are 50 to 200 yards long, have minimal soils development or vegetative cover, as is the case on the west end of Opal Bench, and are very susceptible to water erosion. Topsoil on these slopes is negligible and salvage determinations should be made on the site.

Dissected fans surround the uplands and are characterized by well-drained soils of varying textures, depth to bedrock, and salinity content. Due to high salt content, many of these soils are highly susceptible to water erosion and internal piping with subsequent subsidence. Topsoil can be salvaged from 6 to 12 inches. Isolated areas of sand dunes occur in these areas.

Small portions of the ROWs cross low fans and flood plains characterized by silty clay soils with high salinity and alkalinity as are found in the NESE of Section 26, T22N, RI12W, and the SWSW of Section 7, T22N, RIIIW at Shute Creek. These soils have low bearing strength and when wet, are impassable. Depth to shale bedrock is usually below 60 inches. Topsoil can be salvaged to about 6 inches.

Drainage crossings such as Craven Creek in the NWNE of Section 24, T21N, RI14W; Cow Hollow Creek in the SENW of Section 10, T21N, R113W; and Shute Creek in the SWSW of Section 7, T22N, R111W, have narrow riparian areas, often with steep near-vertical banks. Breaches in these banks often result in access points for livestock and vehicles, leading to soil compaction, increased runoff, and accelerated erosion.

3.4 WATER RESOURCES

Detailed discussions of surface and ground water throughout the project area can be found in the Green River Resource Area RMP EIS (BLM 1992, 1996a), Kemmerer RMP EIS (BLM 1985a, 1985b), Fontenelle Natural Gas Infill Drilling Projects EIS (BLM 1995a), and the EIS for the Expanded Moxa Arch Area Natural Gas Development Project (BLM 1995b).

3.4.1 Surface Waters

The major surface water resource along the proposed pipeline route is the Green River, a major tributary of the Colorado River. The Green River in the vicinity of the proposed pipeline crossing is listed as a monitoring stream in the 1998 Wyoming Section 303(d) Master File and not as impaired waters. The WDEQ/WQD classifies both of these river sections as Class 2–cold water game fisheries. Other surface water resources include numerous intermittent, ephemeral and perennial streams, livestock ponds, and seeps and springs (BLM 1995b).

Streams both north and south of the Green River and Fontenelle Reservoir are sensitive to channel disturbance and to increases in surface runoff and/ or tributary inflow and sediment (BLM 1995b). Stream bank erosion potential is high to very high, and recovery potential ranges from very poor to good, depending on stream type.

3.4.2 Ground Water

The proposed pipeline would disturb only the upper 5 to 6 ft of soils. Deeper water-bearing formations would not be affected and are therefore not discussed further.

3.5 VEGETATION/RIPARIAN AREAS

3.5.1 Vegetation

Vegetation in the vicinity of the proposed pipeline route is typical of the Green River Basin, where plant production, distribution, and species composition are controlled by precipitation, available water, and soil limitations. In this semi-arid region, drought-, salt-, and alkaline-tolerant species dominate the landscape except along perennial water courses and at other locations where more water is available (BLM 1995b, 1996b). Vegetation consists primarily of mixed desert shrubs (such as sagebrush, rabbitbrush, saltbush, and greasewood), with grasses and forbs (such as thickspike wheatgrass, needle-and-thread grass, Sandberg blue grass, snakeweed, and cushion plant communities) in the under story. Cottonwoods and willows are found in the riparian areas along the Green River (BLM 1985a, 1995a, 1996a, 1996c).

Extensive discussions of vegetation communities along the proposed pipeline route are presented in the Green River Resource Area RMP EIS (BLM 1992, 1996a), Kemmerer RMP EIS (ELM 1985a, 1985b), Fontenelle Natural Gas Infill Drilling Projects EIS (BLM 1995a), and the EIS for the Expanded Moxa Arch Area Natural Gas Development Project (BLM 1995b).

3.5.2 Riparian Areas

Riparian areas, protected under Executive Order (EO) No.11990, and wetlands, protected under Section 404 of the Clean Water Act (33 CFR 1251 et seq.), are considered sensitive and valuable resources. Formal wetland delineations were not performed, but potential wetlands along the proposed pipeline route were identified from National Wetlands Inventory maps (USFWS 1989, 1991).

Other than the potential wetlands associated with the Green River, potential wetlands along the proposed pipeline route are either excavated areas likely used as stock ponds or crossings of intermittent or ephemeral drainages. South of the Jonah Gas Hub, the proposed pipeline first crosses an unnamed drainage south of Anderson Canyon in the SE of Section 22, T25N, RIIIW. Further south and east of Fontenelle Reservoir, the proposed route crosses another drainage in the SE of Section 27, T24N, RIIIW. Both of these drainages are classified as riverine intermittent stream beds that are temporarily flooded. Wetlands have been identified east of the Green River crossing. Because the proposed pipeline would cross the river either between existing pipelines or to the west of them, no additional wetland disturbance is anticipated at the crossing.

The proposed pipeline route west to Opal would cross an excavated palustrine semipermanently flooded area in the W1/2 of Section 7, T22N, RIIIW, and a less than one acre temporarily flooded and diked palustrine area in the E1/2 of Section 23, T21N, R114W. It would also cross two intermittent seasonally flooded riverine areas: Cow Hollow Creek in the NW of Section 10, T21N, R113W, and Craven Creek off the Ham's Fork in the NE of Section 24, T21N, R114W.

3.5.3 Invasive/Noxious Weeds

The area which includes the Opal Loop Pipeline project is vulnerable to infestations of invasive/noxious weeds such as Canada thistle, musk thistle and black henbane. Any newly disturbed surface within the project area would be susceptible to infestations of invasive/noxious weeds, particularly the species listed above. Monitoring for weed infestations and spraying for two consecutive seasons, after emergence but before seeding, has been an effective method of controlling these species.

3.6 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

3.6.1 Socioeconomics

Counties and communities potentially affected by the Proposed Action include Sublette, Lincoln and Sweetwater counties and the communities of La Barge, Kemmerer, Diamondville and Fontenelle. Potentially affected socioeconomic conditions include temporary housing resources, emergency management services and local government tax revenues.

According to the year 2000 census, Sublette County had a population of 5,920, Lincoln County had 14,573 and Sweetwater County had 37,613. Each county has substantial existing oil and gas development; the Sweetwater County community of Rock Springs serves as the regional oil and gas service center for southwestern Wyoming.

There are several motels in the Lincoln County town of La Barge, which is located near the north end of the proposed pipeline. A substantial number of motels and recreational vehicle (RV) parks are located in the Kemmerer/Diamondville area (also in Lincoln County) which is located toward the southern end of the proposed pipeline. There is a small campground in the community of Fontenelle. Emergency response services (fire, ambulance, law enforcement) are located in both La Barge and Kemmerer/Diamondville, and hospital services are available in Kemmerer.

Oil and gas facilities such as pipelines and compressors stations are assessed ad valorem property taxes based on 11.5 percent of the value of the facilities. Projects also pay sales and use taxes on tangible goods sold or used. The Wyoming statewide property tax is four percent, counties may levy up to an additional two percent based on voter approval.

3.6.2 Environmental Justice

Executive Order (EO) 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations" was published in the *Federal Register* (59 FR 7629 on February 11, 1994. EO 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations (defined as those living below the poverty level). The Executive Order makes clear that its provisions apply fully to American Indian populations and Indian tribes, specifically to affects on tribal lands, treaty rights, trust responsibilities, and the health and environment of Indian communities.

Environmental Justice concerns are usually directly associated with impacts on the natural and physical environment but these impacts are likely to be interrelated to social and economic impacts as well. There are no communities immediately adjacent the proposed pipeline or ancillary facilities.

Native American access to cultural and religious sites may fall under the umbrella of environmental justice concerns if the sites are on tribal lands or access to a specific location has been granted by treaty right. With regard to environmental justice issues affecting Native American tribes or groups, the project area contains no tribal lands or Indian communities, and no treaty rights or Indian trust resources are known to exist for this area.

3.7 CULTURAL RESOURCES

Cultural resources, the nonrenewable remains of past human activity, are protected under the National Historic Preservation Act of 1966 and the Archaeological Resource Protection Act of 1979. Archaeological investigations in the Green River Basin indicate that the area has been used by prehistoric people for at least 10,000 years, from Paleoindian times to the present (BLM 1995b). The archaeological record of the area has been established through surveys, test excavations, data recovery excavations, a limited amount of ethnographic material pertaining to the extant Native American populations at the time of Euro-American contact, and historic documents pertaining to the settlement and use of the area by Euro-Americans. Historically, the project area has been used for trapping, ranching, sheep herding, and as a travel corridor west via the Oregon Trail. More detailed descriptions of the cultural resources in the project area are presented in the Green River Resource Area RMP EIS (BLM 1992, 1996a), Kemmerer RMP EIS (BLM 1985a, Fontenelle Natural Gas Infill Drilling Projects EIS (BLM 1995a), and the EIS for the Expanded Moxa Arch Area Natural Gas Development Project (BLM 1995b).

A Class III cultural resource inventory was conducted on the proposed pipeline corridor in the spring, 2001. The inventory resulted in the identification of 46 previously recorded sites, the identification and evaluation of three previously recorded sites, the identification and re-recordation of one previously recorded site and the identification, recordation and evaluation of five new site locations. In addition, six isolated finds were located and collected.

Cultural clearance is recommended for the proposed Jonah Gas Gathering Company, Opal Loop Pipeline. This undertaking would impact a total of 55 sites, but the area of impact is restricted to non-contributing portions of significant sites or non-eligible sites. As cultural resources that are not eligible for the NRHP are not considered "historic sites", then by the Advisory Council's guidelines for Section 106 compliance there would be no effect to any historic properties by the construction or maintenance of the proposed pipeline.

3.8 NOISE

Noise in the vicinity of the proposed pipeline route is primarily from wind; traffic on U.S. 30 and other paved, unpaved, and two-track roads; and jet aircraft overflights at high altitudes. Noise-sensitive areas include residences, recreation sites, occupied raptor nests, active sage grouse leks, and pronghorn antelope crucial winter range during crucial winter periods.

3.9 VISUAL RESOURCES

The proposed pipeline route crosses three Visual Resource Management (VRM) sensitivity classes

(Classes II, III, and IV). Most of the pipeline route would be in Class IV VRM areas. The pipeline would cross Class II and Class III VRM areas along the Green River. The proposed compressor station would be constructed in a VRM Class IV area. The objective of Class II is to retain the existing character of the landscape. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the landscape. The Class III objective is to partially retain the existing character of the landscape. Projects in these areas may draw a casual observer's attention, but they should not dominate the landscape. The objective of Class IV areas is to provide for management activities requiring major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high, and management activities may dominate the view; however, the change should repeat the basic elements (form, line, color, and texture) of the surrounding landscape.

3.10 WILDLIFE AND FISHERIES

Detailed accounts of the wildlife and fish that inhabit areas along the proposed pipeline route can be found in the Green River and Kemmerer RMPs (BLM 1996a, 1985a) and the Jonah Field II, Fontenelle, and the Moxa Arch EISs (BLM 1997c, 1995a, 1995b). Additionally, resource inventory maps are provided in the environmental analysis completed on the existing Bird-Canyon-Opal Pipeline (Environmental Assessment and Finding of No Significant Impact for the Bird Canyon-Opal Pipeline, Granger Spur Pipelines, and One Compressor Station, Sublette, Sweetwater, and Lincoln Counties, Wyoming, BLM 1999).

3.10.1 Big Game

Four big game species--pronghorn antelope, mule deer, elk, and moose--occur in the vicinity of the proposed pipeline route. The WGFD manages these animals in major herd units.

3.10.1.1 Pronghorn

Pronghorn belonging to the Sublette (north of Route 30) herd inhabit areas along the proposed pipeline route. The pipeline would pass through pronghorn crucial winter /year long range north and south of the Green River (see Map 3.1 of the Bird Canyon-Opal Pipeline EA) (WGFD 1997; BLM 1995a, 1995b; Lovell 1998; Dunder 1998).

3.10.1.2 Mule Deer

Mule deer along the proposed pipeline route belong to the Sublette (north of the Green River, west and north of Sweetwater County Road 49), Steamboat (north of the Green River, east and south of Road 49), and Wyoming Range (south of the Green River) herds. The pipeline would cross mule deer migration routes and winter /year long range, but no crucial winter range occurs along the route (see Map 3.2 of the Bird Canyon-Opal Pipeline EA) (personal communication, November 5, 1998, with V. Herren, BLM, Kemmerer; personal communication, November 16,1998, with T. Christiansen, WGFD, Green River; WGFD 1997; BLM 1995a, 1995b; Lovell 1998; Dunder 1998).

3.10.1.3 Elk

Elk from the Pinedale (north of the Green River) and West Green River (south of the Green River) herds inhabit areas along the proposed pipeline route. South of the Green River, pipeline route crosses severe winter relief range which is only used during extreme weather conditions when preferred, higher quality winter range is not available. The proposed pipeline would disturb approximately 51 acres of elk severe winter relief range. No crucial winter range for elk exists along the proposed pipeline route (see Map 3.3 of the Bird Canyon-Opal Pipeline EA) (WGFD 1997; BLM 1995a, 1995b).

3.10.1.4 Moose

Moose from the Sublette (north of the Green River) and Lincoln (south of the Green River) herds occur along the proposed pipeline route. There is winter/year long range along the Green River, but no crucial range occurs along the route (see Map 3.4 of the Bird Canyon-Opal Pipeline EA) (WGFD 1997; BLM 1995a, 1995b).

3.10.2 Raptors

A number of raptors nest on the cliffs, bluffs, and trees adjacent to the Green River and on rocky outcrops in the large canyons above the river. Golden eagle, red-tailed hawk, ferruginous hawk, and great horned owl are known to nest in the vicinity of the proposed pipeline route. Bald eagle, Swainson's hawk, northern harrier, prairie falcon, American kestrel, merlin, and osprey also may occasionally nest in the area. Other raptor species may frequent the area during the summer months, including sharp-shinned hawk, Cooper's hawk, northern goshawk, and long-eared owl. Although most nesting birds migrate south during the winter, golden eagles and great horned owls may remain all year. Rough-legged hawks may occupy the area during winter, but tend to move north to breed in the spring. From November through February, bald eagles roost in cottonwood trees along the Green River, especially in Seedskadee National Wildlife Refuge.

There is suitable raptor nesting and roosting habitat in the vicinity of the Green River crossing, but no nests or roosts were observed within 0.5 mi of the crossing during a field inspection on November 16, 1998, and April, 2001.

3.10.3 Upland Game Birds

3.10.3.1 Mourning Dove

Mourning doves breed, nest, and roost during spring and summer in shrubby areas along perennial water sources, washes, and dunes in the vicinity of proposed pipeline route. Doves migrate from the area in fall and winter.

3.10.3.2 Sage Grouse

Sage grouse are the predominant game bird in southwestern Wyoming, and the area of the proposed pipeline contains some of the highest concentrations of these birds in the state (BLM 1995b). Important habitat components for sage grouse are leks and nesting areas, brood-rearing areas, and wintering areas. Sage grouse usually nest on the ground under sagebrush 15 to 22 inches tall and depend on sagebrush canopy cover for nest concealment (BLM 1995a). A number of sage grouse leks and nesting areas occur along the proposed pipeline route (Map 3.5 of the Bird Canyon-Opal Pipeline EA) (Lovell 1998).

3.10.4 Other Wildlife

Numerous other small mammals, birds, amphibians, and reptiles occur in project area. Wading/shorebirds and waterfowl occur along the Green River. Lists of these wildlife species can be found in the Fontenelle and Jonah II EISs (BLM 1995a, 1997c).

3.10.5 Fisheries

The Green River below the Fontenelle Dam is a Class 2 trout fishery–a fishery of statewide importance (WGFD 1991). The river supports brown, rainbow, and cutthroat trout, as well as Kokanee salmon, which spawn in October downstream of the dam (BLM 1995a). Most of the remaining drainages along the pipeline route are ephemeral or intermittent and are unable to support sustainable fish populations due to insufficient flow (BLM 1995b).

3.11 THREATENED, ENDANGERED, CANDIDATE, AND SENSITIVE ANIMAL AND PLANT SPECIES

The Endangered Species Act 011973 (ESA) protects federally listed T&E animal and plant species and their critical habitats. Species that are federal candidates for listing as T &E are not protected under the ESA, but are provided protection by the BLM under the guidelines of BLM Manual Section 6840. Under these regulations, the BLM is directed to ensure that actions authorized, funded, or carried out by the agency do not contribute to the need to list these species as T&E. The USFWS was contacted to initiate informal Section 7 consultation and obtain a list of T &E species potentially present in the project areas (Long 2001). In addition, observation records of sensitive species were obtained from the Wyoming Natural Diversity Database (WYNDD) for areas along anrf adjacent to the pipeline route (WYNDD 1998). Summaries of potential animal and plant species of concern are presented in Tables 3-5 and 3-6.

Detailed descriptions of T &E, candidate, and sensitive animal and plant species that may occur in the proposed project area are presented in the Moxa Arch and Fontenelle EISs (BLM 1995a, 1995b). T &E listed and proposed animal and plant species listed by the USFWS that may occur in the vicinity of the proposed pipeline route are bald eagle, black-footed ferret, whooping crane, Ute ladies'- tresses (Long 2001).

3.11.1 Bald Eagle

A portion of the proposed pipeline is adjacent to a bald eagle foraging and potential nesting and roosting area within the Seedskadee National Wildlife Refuge. The Green River crossing would be within 1 mile of an eagle nest that was last active in 1995. The nest site itself, however, is not observable from the crossing. No nesting activity was noted at the eagle nest in a survey conducted by BLM in April, 2001(Dunder 2001).

3.11.2 Black-footed Ferret

White-tailed prairie dog colonies constitute potential habitat for black-footed ferrets. Ferrets prey on prairie dogs for food and use their burrows for shelter and raising young. No active colonies were found along the proposed pipeline route north of the Green River and west of the Moxa Arch Analysis Area in Sections 9,16, 17, and 18, T21N, R113W, and Sections 13, 22, 23, and 24, T21N, R114W, during field inspections on October 23, 1998 (Dunder 1998; Hemen 1998). Several colonies do, however, occur along proposed route within the Moxa Arch Analysis Area (BLM 1995b; Hemen 1998). The USFWS requires that ferret surveys be conducted if proposed construction activities would disturb portions of prairie dog colonies or complexes greater than 200 acres with burrow densities of at least eight per acre (Long 2001). The proposed pipeline would pass through seven white-tailed prairie dog colonies, all of which are included in a greater complex (BLM 1995b) (Map 3.5 of the Bird Canyon-Opal Pipeline EA). BLM (Dunder 2001) considers existing White-tailed prairie dog survey data as being current. No additional White-tailed prairie dog surveys were conducted along the proposed Opal Loop pipeline corridor in 2001. However, Black-footed ferret surveys will

Table 3-5. Animal Species of Concern Potentially Occurring in the Vicinity of the Proposed Pipeline Route.

Scientific Name	Common Name	Federal Status	Management Status[1]	State Rank[2]	WGFD Status[3]
Birds					
Haliaeetus leucocephalus	Bald eagle	Threatened		S2B, S3N	SSC2
Falco peregrinus	Peregrine falcon	Endangered			
Grus americana	Whooping crane	Endangered		SA	
Botaurus lentiginosus	American bittern		S-USFS R2	S3B, SZN	SSC3
Ardea herodias	Great blue heron			S3B, SZN	
Pandion haliaetus	Osprey		S-USFS R2	S3B, SZN	
Falco columbarius	Merlin		S-USFS R2	S3B, SZN	SSC3
Thryomanes bewickii	Bewick's wren			S3S4	
Athene cunicularia	Burrowing owl		S-USFS R2	S4B	SSC4
Fish					
Gila elegans	Bonytail	Endangered			
Ptychocheilus lucius	Colorado squawfish	Endangered			
Gila cypha	Humpback chub	Endangered			
Xyrauchen texanus	Razorback sucker	Endangered			
Oncorhynchus clarki pleuriticus	Colorado River cutthroat trout		S-USFS R2, R4	S2	
Gila robusta	Roundtail chub			S2?	
Catostomus discobolus	Bluehead sucker			S3	
Catostomus latipinnis	Flannelmouth sucker			S3	
Mammals					
Mustela nigripes	Black-footed ferret	Endangered			
Brachylagus idahoensis	Pygmy rabbit			S2	SSC3
Gulo gulo	Wolverine		S-USFS R2, R4	S1	SSC3
Lynx canadensis	Canada Lynx	Threatened		S1	SSC2

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Table 3-5 (Continued)

Source: Long (1998); WYNDD (1998).

[1] Management Status: S-USFS R2 or R4 = Sensitive, USFS Region 2 or Region 4, respectively.

[2] State Rank: assigned by WYNDD and reflect status of species within political borders of the State of Wyoming:

S1 = Extremely rare, S2 = Very rare, S3 = Rare, S4 = Apparently secure, but may be rare in portions of its range, S5 = Secure under present conditions. "B" following state rank indicates breeding status; "N" indicates non-breeding status.

SA = accidental in state, Wyoming not considered normal range for the species; SZN = not of significant status when migrating through the state, includes uncommon migrants.

[3] WGFD Status = Wyoming Game and Fish Department Status:

SSC = Species of Special Concern.

SSC1 = Species with ongoing significant habitat loss, populations greatly restricted or declining, and extirpation appears possible.

SSC2 = Species 1) whose habitat is limited or vulnerable, but no recent or significant loss has occurred, and populations are greatly restricted or declining; or 2) with ongoing significant loss of habitat and populations are declining or restricted in numbers and distribution, but extirpation is not imminent.

SSC3 = Species in which 1) habitat is not limited, but populations are greatly restricted or declining and extirpation appears possible; 2) habitat is limited or vulnerable, although no significant recent loss has occurred, and populations are declining or restricted in numbers or distribution, but extirpation is not imminent; or 3) significant habitat loss is ongoing, but the species is widely distributed and population trends are thought to be stable.

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be required for those habitats meeting the minimum USFWS Black-footed ferret habitat definition.

Table 3-6. Special Status Plant Species on and near the JGGC Natural Gas Pipeline.

Scientific Name	Common Name	Field Office Where Listed
Federally Listed		
Spiranthes diluvialis	Ute Ladies'-tresses	
BLM Sensitive		
Astragalus nelsonianus	Nelson's milkvetch	Rock Springs Field Office (RSFO)
Astragalus racemosus var. treleasei	Trelease's milkvetch	Kemmerer Field Office (KFO), Pinedale Field Office (PFO)
Lepidium integrifolium var. integrifolium	Entire-leaved peppergrass	RSFO
Lesquerella macrocarpa	Large-fruited bladderpod	RSFO, KFO, PFO
Lesquerella multiceps	Western bladderpod	KFO
Lesquerella prostrata	Prostrate bladderpod	KFO
Phlox pungens	Beaver Rim phlox	RSFO, KFO,PFO
Physaria dornii	Dorn's twinpod	KFO
Physaria condensata	Tufted twinpod	RSFO, KFO, PFO

3.11.3 Whooping Crane

Whooping crane habitat consists of marshes, swamps, and other wetland areas. In the early 1980s, whooping cranes used the Green River during spring and fall migrations, but there have been no reported observations in this area since 1986 (BLM 1995b). WYNDD's most recent documented occurrence of a whooping crane within the area was in September of 1981.

3.11.4 Mountain Plover

The animal species proposed for listing that may occur in sagebrush and grasslands within the project area is the mountain plover (Long 2001).

A mountain plover survey was completed along the proposed Opal Loop Pipeline on May 6, 2001. Nearly all of the survey area was dominated by sagebrush. Very little potential plover habitat was found and no plovers were heard or seen during the survey. Approximately 1.5 miles of the alignment passed through good potential plover habitat in Sections 24 and 25, T22N, R112W near two main roads that sustained heavy traffic. Several other patches of marginal habitat occurred about one mile north of the Green River.

Only three percent of the pipeline corridor passes through habitats flat enough, and with short enough vegetation to provide potential plover habitat. However this one short patch of good plover habitat is unlikely to be used by plovers because of it's proximity to heavily traveled roads. Because there is very little potentially suitable habitat and the fact that no plovers were found during the survey, the placement of a pipeline within this corridor is not expected to reduce the breeding potential for this species. Even in the unlikely event that the surveyors missed a plover on a nest, the late start-up date for construction (August or later) insures that young plovers will be hatched and flying before earth-disturbing events occur.

3.11.5 Canada lynx

In Wyoming the Canada lynx occurs in extensive tracts of dense coniferous forest, primarily dominated by Englemann spruce and subalpine fir. These habitats are typically found in the high mountainous regions of western Wyoming. As of 1996 the WOS contained only 14 lynx records. Habitat in the project area (primarily sagebrush steppe) is not suitable for consistent long-term use by lynx. Canada lynx was last observed in the general vicinity of the pipeline route in the mid-1970s.

3.11.6 Sensitive and Candidate Wildlife Species

State sensitive animal species that could occur in the vicinity of the proposed pipeline route include American bittern, great blue heron, osprey, merlin, burrowing owl, Bewick's wren, roundtail chub, flannelmouth sucker, Colorado River cutthroat trout, bluehead sucker, pygmy rabbit, and wolverine. (WYNDD 1998).

According to WYNDD records (1998), all the above mentioned state sensitive birds have been observed southeast of the proposed Green River pipeline crossing in the Seedskadee National Wildlife Refuge. In 1990, a merlin nested in the refuge. An active great blue heron rookery was observed there in 1982, and burrowing owl nesting activity was observed in 1977. Roundtail chub and flannelmouth sucker have occurred in the Green and Hams Fork Rivers, but the most recent records date from the late 1970s and 1980s. The closest genetically pure population of Colorado River cutthroat trout has been observed more than 12 miles north and west of the project area. WYNDD has one 1979 record of a bluehead sucker from the Green River north of Fontenelle Reservoir. Pygmy rabbits were observed along proposed pipeline route in T22N, R111W, in 1991. Known habitat for pygmy rabbits occurs along the proposed pipeline route in Sections 23, 26, and 36 in T22N, R111W. Wolverine was last observed in the general vicinity of the pipeline route in the mid-1970s.

3.11.7 Plants

No federally listed T&E plant species are known to occur in the project area, and only marginal habitat for the threatened Ute ladies' tresses was observed at the Green River crossing during field inspection on November 16, 1998. Potential habitat areas for Ute ladies' tresses are shown on Maps 3.6, 3.7, and 3.8 in the Bird Canyon-Opal Pipeline EA (WGFD 1997; BLM 1995a, 1995b). Soils in the vicinity of the crossings generally are clay/alkaline with some lowland grasses. Ute ladies' tresses has the potential to occur in flood plains, abandoned stream channels, and meanders on permeable materials where soils are saturated to within 18 inches of the surface, at least temporarily during the spring or summer. This plant generally occurs below 7,000 ft in elevation. Populations in Montana and Wyoming are known to occur in alkaline soil (personal communication, January 1999, with Walt Fertig, Wyoming Natural Diversity Database; Heidel 1997). Associated vegetation includes: horsetail, verbena, lobelia, carpet bent, western goldenrod, milkweed, sweetclover, Indian paintbrush, rush, willows, Russian olive, and alder. To date, there have been no documented observations of Ute ladies' tresses along the Green River in Wyoming.

The Rock Springs Field Office of the BLM has assigned special status designation to the following plant species that may occur in the vicinity of the proposed pipeline: Big Piney milkvetch (Astragalus drabellijonnis), Cedar Rim thistle (Cirsium aridum), large-fruited bladderpod (Lesquerella macrocarp). Payson's bladderpod (L. paysonii), Swallen mountain-ricegrass (Oryzopsis swallenii), Opal phlox (Phlox opalensis), beaver rim phlox (P. pungens), and tufted twinpod (Physaria condensata) (see Table 3-6). Known potential habitat areas for these species are shown on Maps 3.6, 3.7, and 3.8 of Bird Canyon-Opal Pipeline EA) (WGFD 1997; BLM 1995a, 1995b). The Bird Canyon-Opal Pipeline EA is availabe for review at the Kemmerer and Rock Springs Field Offices.

Big Piney milkvetch has the potential to occur on open sites on sandstone, stony clay, badlands, and barren clay slopes and ridges, primarily on the LaBarge and Chappos members of the Wasatch Formation in the Green River Basin from 6,900 to 7,150 ft in elevation. Associated vegetation includes: rubber rabbitbrush, sagebrush species, hoary aster, stemless goldenweed, granite pricklygilia, milkvetch, and Hooker sandwort. Documented observations of the Big Piney milkvetch in Wyoming are limited to the Big Piney, Wyoming, area, northwest of the proposed pipeline route. The potential for Big Piney milkvetch occurring on the proposed pipeline corridor is low.

Cedar Rim thistle typically occurs on barren slopes, fans, and draws on whitish gray sandstone, chalk, tufaceous colluvium, or clay substrates. Areas of suitable habitat often occur as islands within more common communities (e.g., Wyoming big sagebrush grasslands or dense montane shrub) (Fertig 1995) at elevations from 6,700 to 7,200 ft (BLM 1995b). Associated vegetation includes bluebunch wheatgrass, Indian ricegrass, and contracted Indian ricegrass. Grass cover in Cedar Rim thistle habitat is typically low. The Cedar Rim thistle may also colonize disturbed sites such as graded dirt roads and barrow pits, provided the proper substrate is exposed. Several documented observations of Cedar Rim thistle were recorded north of the proposed pipeline route in T28N, RII0W, and T28N, RIIIW. There is potential for this plant to occur within the proposed pipeline route.

Potential habitat for large-fruited bladderpod includes sparsely vegetated open areas with loose clay soils on flats, toeslopes, and hills at elevations from 7,000 to 7,800 ft. Associated vegetation includes Gardner's saltbush, bottlebrush squirreltail, squarestem phlox, springparsely, and biscuitroot. Documented observations of the large-fruited bladderpod occur northeast of the proposed pipeline route; however, there is potential for this plant to occur along the proposed pipeline route.

Payson's bladderpod is endemic to Lincoln, Sublette, and Teton Counties of northwestern Wyoming. It is primarily found on windswept, gravelly, calcareous ridgecrests; semi-open slopes; and rocky floodplains. This species is often associated with big sagebrush grassland communities where total vegetative cover is between 25 and 50%. Populations of Payson's bladderpod have also been reported on talus slopes, disturbed roadsides, dry stream channels, and rocky clearings in lodgepole pine and subalpine fir forest (Fertig 1997). Known populations of this species occur northwest of the proposed pipeline route in mountainous terrain; therefore, the potential for occurrence within the proposed route is low.

Swallen mountain-ricegrass has the potential to occur on rocky knobs and hills, mesa and basin areas, and gravelly ridges along the proposed pipeline route between 6,600 and 6,900 ft in elevation. Associated vegetation include black sagebrush, big sagebrush, and low sagebrush. Swallen mountain-ricegrass has been documented along the south end of Fontenelle Reservoir and north and west of the proposed Bird Canyon Compressor Station.

Potential habitat for Opal phlox includes open desert shrub or cushion plant communities on fine-textured clay-shale flats, slopes, and rims from 6,300 to 7,000 ft in. elevation (BLM 1995b; Fertig 1996). Preferred sites often have a surface of chert or reddish sandstone gravel that accounts for 50% or more of total ground cover. Opal phlox is often encountered in communities dominated by Gardner's saltbush, rubber rabbitbrush, Indian ricegrass, Sandberg bluegrass, and bud sagebrush. Documented observations of Opal phlox are widespread throughout the vicinity of the proposed pipeline route and are typically associated with rim habitats such as the Opal Bench (Fertig 1996).

Beaver Rim phlox has the potential to occur on sparsely vegetated 30% slopes with shale, siltstone, and sandstone platy fragments and silt loam soil over fractured bedrock. The plant prefers habitats from 6,635 to 7,055 ft in elevation on the Laney Member of the Green River Formation. Vegetation associated with this plant includes stemless goldenweed, Sandberg bluegrass, shadscale, miner's candle, rubber rabbitbrush, sagebrush, silky locoweed, wild buckwheat, aster, slender wheatgrass, and bluebunch wheatgrass (BLM 1995b). Observations of Beaver Rim phlox populations have been recorded north of the Green River primarily in Anderson and Bird Canyons (Dorn 1994).

Tufted twinpod has the potential to occur on sparsely vegetated calcareous shale knolls, foothills, rocky ridges, and slopes at Green River shale outcrops from 6,000 to 7,600 ft in elevation. Associated vegetation includes juniper, stemless goldenweed, phlox byroides, sandwort, Gilia spp., shadscale, Gardner's saltbush, princess plume, wild buckwheat, milkweed, silky locoweed, and wheatgrass species. The species has been recorded in the Bird Canyon area, northwest of the proposed pipeline and compressor station.

State sensitive plant species include all the aforementioned BLM-listed species, as well as honey-scent sand verbena, King's milkvetch, Trelease's racemose milkvetch, sickle saltbush, echo spring-parsley, Wilcox eriastrum, divergent wild buckwheat, compact gilia, juniper prickly-pear, rufous-spine prickly-pear, Payson beardtongue, and sticky scorpion-weed.

3.12 WILD HORSES

The Wild Free-Roaming Horses and Burros Act of 1971 prohibits the capture or harassment of wild free-roaming horses and burros on BLM lands. Protected horses and burros are to be considered an integral part of the natural system on areas where they were found in 1971 and are to be managed under the multiple use concept (BLM 1994).

Approximately 23 miles of the proposed pipeline route, from the Jonah Gas Hub to the Green River crossing, is within the Little Colorado Desert Wild Horse Herd Management Area (WHHMA). This WHHMA is a designated management area with an appropriate management level of 69 to 100 animals.

3.13 RANGE/OTHER LAND USES

Major land uses in the project area include oil and gas production, livestock grazing, wildlife habitat, and recreation. The proposed pipeline routes would disturb portions of several grazing allotments. North of the Green River, the routes would cross the Figure Four, Eighteen Mile, and Lombard allotments (BLM 1996a). South and west of the Green River, the routes would pass through the Seedskadee, Cow Hollow, Slate Creek, and Granger Lease allotments (BLM 1985a). Table 3-7 presents acreage and animal unit month (AUM) information for each allotment potentially affected by proposed construction activities.

The areas in Sublette County through which the proposed pipeline route passes are zoned RC (Resource/Conservation) (personal communication, October 21, 1998, Joanne Garnett, Sublette County Planner, Pinedale). In Lincoln County, the areas are zoned public, rural, and industrial (personal communication, October 21, 1998, Mike Archibald, Lincoln County Planner, Kemmerer). Areas of Sweetwater County traversed by the proposed routes are zoned agricultural, with some areas of mineral development (personal communication, November 3, 1998, Jeff Schalow,

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Sweetwater County Land Use Director, Green River).

Table 3.7. Grazing Allotments Potentially Affected by the Project.

Allotment	Size (Acres)	Acres/AUM	Livestock Type	Season of Use	Pipeline ROW Acres (AUMs) Within Allotment
Figure Four	114,425	17	Sheep/Cattle	All Year	30 (1.8)
Eighteen-Mile	228,840	12	Sheep/Cattle	All Year	128 (10.7)
Lombard	94,802	12	Sheep/Cattle	All Year	52 (4.3)
Seedskadee	12,555	16	Sheep/Cattle	5/1 -12/31	13 (0.8)
Slate Creek	271,170	22	Sheep/Cattle	4/26- 11/30	103 (4.7)
Cow Hollow	14,753	14	Cattle	5/15 -10/31	35 (2.5)
Granger Lease	522,245	14	Sheep/Cattle	Dec - Apr./ May - Oct.	223 (15.9)
Total					584 (40.7)

Sources: BLM (1994, 1995a, 1995b, 1996b); personal communication, October 21, 1998, and November 6, 1998, with Nancy Baker, BLM, Range Management Specialist, Rock Springs; personal communication, October 21, 1998 with Pat Netherly, BLM, Range Management Specialist, Kemmerer.

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CHAPTER 4

ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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CHAPTER 4

ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

This chapter of the environmental assessment (EA) provides an analysis of the potential environmental consequences that would result from implementation of the proposed JGCC Opal Loop natural gas pipeline project and/or alternatives, including the compressor stations. Certain measures that would avoid or reduce impacts under the Proposed Action have been included in Chapter 2. The following impact assessment takes these measures into consideration. Additional opportunities to mitigate impacts beyond the measures proposed in Chapter 2 are presented in this chapter for each resource discipline.

An environmental impact or consequence is defined as a modification or change in the existing environment brought about by the proposed action or alternatives to the proposed action. Impacts can be direct or indirect in nature, and can be permanent (long-term) or temporary (short-term). Impacts can vary in degree ranging from only a slight discernable change to a drastic change in the environment. Short-term impacts are impacts that occur during and immediately after pipeline construction and testing and last from two to five years. For purposes of this EA, short-term impacts are defined as lasting five years or less. Long-term impacts are impacts imposed by construction and operations that remain longer than five years and extend for the life of the project and beyond.

Impact significance criteria are presented for each resource potentially adversely affected. These criteria are based on existing regulatory standards, scientific and environmental documentation, and/or professional judgment. Potential impacts for this project were classified as either significant or not significant. Significant impacts (as defined in CEQ guidelines 40 CFR 1500-1508) are effects that are most substantial and therefore should receive the greatest attention in decision-making. In addition, a finding of significant impacts would necessitate the preparation of an EIS. In the following discussions, impacts are considered adverse unless identified as beneficial.

Discussions of the potential environmental consequences to adversely affected resources include the following.

Significance Criteria. The level of impact that would be significant, based on regulatory standards, available scientific documentation, and the professional judgment of BLM resource specialists.

Impacts. The level and duration of impacts that would occur as a result of the Proposed Action or the No Action Alternative. The impact evaluation assumes that the applicant-committed practices described in Chapter 2.0 would be implemented

Mitigation. Any measures, in addition to those described in Chapter 2.0, that could be applied to avoid or further reduce adverse impacts.

Unavoidable adverse impacts, short-term use of the environment versus long-term productivity, irreversible and irretrievable commitment of resources, and cumulative impacts are discussed in separate sections following the discussions of the specific resources (Sections 4.14,4.15,4.16, and 4.17, respectively). Unavoidable adverse impacts cannot be avoided and cannot be completely mitigated. Short-term use of the environment covers the life-of-project (LOP), whereas long-term productivity refers to the period after the project is completed and the area reclaimed. Irreversible and irretrievable impacts are permanent reductions or losses of resources that, once lost, cannot be regained. Cumulative impacts are those which result from the incremental impacts of an action added to other past, present, and reasonably foreseeable actions, regardless of who is responsible for such actions.

4.1 GEOLOGY/MINERALS/PALEONTOLOGY/HAZARDS

4.1.1 Significance Criteria

Impacts to paleontological resources would be significant if the Proposed Action would cause direct damage or destruction of fossils of scientific interest and significance. Impacts would also be significant if construction-related erosion resulted in damage or destruction of fossils or if improved access and visibility due to construction activities led to unauthorized fossil collection or vandalism (EVG 1998).

4.1.2 The Proposed Action

Excavation for the pipeline would penetrate bedrock in some areas. With the implementation of applicant-committed practices and those listed in Sections 4.1.4.1 and 4.1.4.2, there would be no significant adverse impacts to paleontological resources from the Proposed Action.

4.1.3 No Action Alternative

Under the No Action Alternative, no project-related disturbance of paleontological resources would occur.

4.1.4 Mitigation

In addition to applicant-committed procedures, the BLM may require the following general and specific mitigation measures.

4.1.4.1 General Mitigation Measures

The following general mitigation measures would mitigate adverse impacts to fossil resources potentially occurring in the project area.

Worker Instruction - Construction personnel could be instructed about the types of fossils likely to be encountered, legal requirements, and procedures to follow should fossils be uncovered.

Discovery Contingency - If suspected fossil materials are uncovered during construction, the Operator would be required to stop work immediately and contact the BLM AO. Activities would not be resumed until the AO has assessed the situation and provided advice as to whether any mitigating measures need to be undertaken before operations can continue.

Field Survey - A qualified paleontologist could conduct preconstruction field surveys where construction would disturb bedrock with documented, scientifically significant, fossil site localities within 0.5 mi of the pipeline corridor. Other areas that meet Condition 2 (H-8270-1 General Procedural Guidance for Paleontological Resources Management) could be spot checked.

4.1.4.2 Specific Mitigation Measures

The following specific mitigation measures would mitigate adverse impacts to fossil resources in the Green River or Bridger Formations, where specific paleontological resources of scientific significance have been identified.

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Monitoring - Construction activities could be monitored where field surveys are performed and where spot checks indicate monitoring is warranted. Monitoring may involve close examination of the bladed ROW /TUPs and spoil piles in fossiliferous areas by a qualified paleontologist.

Curation of Specimens - Fossil specimens discovered during monitoring could be prepared, identified, and catalogued into the permanent collections of an established museum repository acceptable to the BLM.

Final Technical Document - A report could be prepared to document the mitigation work conducted and accession list of fossil specimens listed by locality.

4.2 CLIMATE AND AIR QUALITY

4.2.1 Introduction

4.2.1.1 Climate

No significant, adverse impacts to climate are anticipated from implementation of the Proposed Action or Alternative.

4.2.1.2 Air Quality

Potential air quality impacts from the Proposed Action and Alternative are analyzed and reported in Section 4.2.3 Direct and Indirect Impacts and in Section 4.2.5 Cumulative Impacts. This analysis is prepared under the requirements of NEPA, in order to assess and disclose "reasonably foreseeable" impacts to both the public and the BLM decision maker before a "Finding of no Significant Impact - Decision Record" (FONSI-DR) is issued. Due to the preliminary nature of the NEPA air quality assessment, it should be considered a "reasonable, but conservative" upper estimate of predicted impacts. Actual impacts at the time of development are likely to be less.

The air quality impact assessment is based on the best available engineering data and assumptions, meteorology data, and EPA dispersion modeling procedures. However, where specific data or procedures were not available, "reasonable, but conservative" assumptions were incorporated. For example, the Proposed Action air quality impact assessment assumed all compressors will operate at full capacity year-round.

Air pollution impacts are limited by state and Federal regulations, standards, and implementation plans established under the Clean Air Act and administered by the WDEQ-AQD. The Clean Air Act dictates that National Ambient Air Quality Standards (NAAQS), established by the EPA, must be maintained nationwide. The NAAQS include standards for six "criteria" pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon dioxide (CO), respirable particulate matter (PM_{10}), sulfur dioxide (SO_2) and lead (Pb). Although the City of Sheridan is designated non-attainment for PM_{10}, all other areas in Wyoming are designated attainment for all criteria pollutants.

State regulations require proposed air pollutant emissions to undergo a permitting review before construction can begin. Therefore, the WDEQ-AQD has the primary authority to review emission permit applications, and to require emission permits, fees and control devices, prior to construction and/or operation. In addition, the United States Congress (through the Clean Air Act Section 116) authorized local, state and tribal air quality regulatory agencies to establish air pollution control requirements more (but not less) stringent than Federal requirements. Additional site-specific air quality analysis would be performed, and additional emission control measures including a "Best

Available Control Technology" (BACT) analysis and determination may be required by the state to ensure protection of air quality resources.

In addition, under the Federal Land Policy and Management Act (FLPMA) and the Clean Air Act, the BLM can not conduct or authorize any activity which does not conform to all applicable local, state, tribal and Federal air quality laws, statues, regulations, standards, and implementation plans.

4.2.2 Significance Criteria

The significance criteria for potential air quality impacts include state and federally enforced legal requirements to ensure air pollutant concentrations will remain within specific allowable levels. These requirements include the Wyoming and National Ambient Air Quality Standards which set maximum limits for several air pollutants, and PSD increments which limit the incremental increase of certain air pollutants above legally defined baseline concentration levels. These legal limits are presented in Table 3-4, Air Pollutant Background Concentrations, State and Federal Ambient Air Quality Standards, and PSD increments.

4.2.3 The Proposed Action

Emissions from construction of the additional compressor facility are temporary and would occur in isolation, without significantly interacting with adjacent facilities. No violations of applicable state or Federal air quality regulations or standards are expected to occur as a result of direct or indirect project air pollutant emissions (including both construction and operation).

Under the proposed action, air emissions of NO_x, CO, VOC, and HAPs (formaldehyde) would occur from operation of the compressor stations. Because emissions are generated from combustion sources burning sweet natural gas, negligible amounts of SO_2 would be emitted.

Emissions from the County Line compressor station were calculated by JGGC for a recent permit application. Emissions for the Bird Canyon compressor station reflect currently permitted levels. All pollutant emissions were estimated using manufacturer's guaranteed emission factors, emission factors from EPA's AP-42, or GRI-HAPCalc, and reflect an operating schedule of 24 hours per day, 365 days per year. Total emission rates from the Bird Canyon and County Line facilities represent maximum annual emissions that would result from the proposed action and are shown in Table 4-1 below.

Prior to construction, a proposed compressor station would be required to obtain an air permit as required by WDEQ. As part of an air quality permit application recently submitted to WDEQ, dispersion modeling for NOx and formaldehyde was performed which included the Bird Canyon and County Line compressor stations (JGGC, 2001). The maximum annual NO_2 concentration modeled at or beyond the property fence line was found to be 28.7 $\mu g/m^3$, including a regional annual ambient NO_2 background concentration of 4.0 $\mu g/m^3$. This modeled concentration is less than the Wyoming and National Ambient Air Quality Standard for NO_2 of 100 $\mu g/m^3$ and is less than the PSD increment for NO_2 of 25 $\mu g/m^3$. These results indicate that the proposed action would be in compliance with applicable air quality standards and would not exceed PSD increments for NO_2.

Furthermore, a incremental risk assessment was performed to calculate long-term risks from exposure to formaldehyde emitted under the proposed action (Air Sciences, 2000). This assessment calculated a maximum risk of 21.9 potential carcinogenic effects in one million along the facility fence line. That risk dropped to one in a million within 0.5 kilometers of the fence line. The nearest residence is approximately 8 miles west of the facility.

Table 4-1. Bird Canyon and County Line Compressor Stations - Annual Emissions.

[illegible]	[illegible]	Annual Emissions (tpy)			
Facility	Emission Source	NOx	CO	VOC	[illegible]
Bird Canyon (existing)	Cat G3612 LE Compressor Engine	19.8	8.5	14.2	1.7
	Cat G3608 LE Compressor Engine	13.5	3.9	9.7	0.6
	Cat G3608 LE Compressor Engine	13.5	3.9	9.7	0.6
	Generator Cat 3412	3.4	3.4	0.7	0.1
	Flare	1.0	3.0	3.3	0
Total Bird Canyon Emissions (tpy)		51.2	22.7	37.6	3.0
County Line (proposed)	Cat G3612 LE Compressor Engine	19.8	8.5	14.2	2.3
	Cat G3612 LE Compressor Engine	19.8	8.5	14.2	2.3
	Cat G3612 LE Compressor Engine	19.8	8.5	14.2	2.3
	Generator Cat 3412	3.4	1.7	1.7	0.2
	Onan 7.5 JB Emergency Generator	0.01	0.2	0.01	0.01
	Combustion Chamber (Flare)	1.1	6.1	2.7	0
Total County Line Emissions (tpy)		63.9	33.5	47.0	7.1
Total Emissions Proposed Action (tpy)		115.1	56.2	84.6	10.1

4.2.4 Alternative A - No Action

Under this alternative the County Line compressor station would not be constructed or operated. Air emissions associated with this alternative would be limited to those from the existing permitted Bird Canyon facility at the emission rates shown above.

4.2.5 Mitigation Summary

A regional inventory of NOx emissions in southwest Wyoming indicated that permitted emissions have decreased significantly since the most recent cumulative analysis (TRC, 2001). (See TRC letter to Arlan Hiner, Appendix B). As a result, development of the project area is not expected to contribute significantly to cumulative air quality impacts in the region.

Manufacturer's emission factors indicate that compressor engines in the proposed action would have an average potential NO_x emission rate of approximately 0.7 grams per horsepower-hour (g/hp-hr) of operation. This emission rate reflects engines equipped with non-selective catalytic reduction (NSCR), and achieve emission control levels that have been attained in similar applications.

Alternate NO_x control measures include reducing compression requirements, electric compression, or the use of lean combustion or selective catalytic reduction (SCR) control technologies.

No significant, adverse direct and indirect impacts to air quality are anticipated from implementation of the Proposed Action or Alternative, as shown in Section 4.2.3 above. Other than the direct and indirect impacts described in Section 4.2.3, there would not be any other residual air quality impacts.

4.3 SOILS

4.3.1 Significance Criteria

Impacts would be considered significant if a reduction in soil productivity and/or increased erosion would prevent successful reclamation and revegetation.

4.3.2 The Proposed Action

The Proposed Action would disturb approximately 488 acres. Potential impacts to soils from the Proposed Action could include increased susceptibility to water and wind erosion, increased sediment and salinity into the Colorado River system, loss of topsoil, soil compaction, and decreased soil and vegetation productivity. Further, cutting a waterbar could discharge runoff on to adjacent ROWs, thereby creating gullies. As a result, the success of reclamation and revegetation efforts could be affected if these are not well-planned and carried out. Pipelines constructed in 1997 and 1999 in the same corridor as the Opal Loop pipeline are stable and generally exhibit successful grass revegetation.

Adherence to a Stormwater Pollution Prevention Plan (SWPP Plan) would ensure that soil movement would be minimized during construction. The entire pipeline ROW would be reclaimed and revegetated immediately after disturbance to stabilize soils. There would be a slight increase in wind and water erosion until the land is stabilized and revegetated; however, overall impacts to soils from the Proposed Action would not be significant.

4.3.3 No Action Alternative

No surface disturbance would occur under the No Action Alternative; therefore, no impacts to soils/watersheds would result. Wind and water erosion would continue at present rates.

4.3.4 Mitigation

Compliance with applicant committed mitigation measures (section 2.8 of this EA) and the oversight of a BLM construction inspector would minimize the chances of reclamation failure.

Appendix B of the Soils and Water Resources Technical Report for the Moxa Arch Area (BLM 1995d) presents mitigation guidelines that include careful construction and performance monitoring to ensure effective application of control measures. These guidelines include stipulations for topsoil salvage and replacement, slope stabilization, and runoff control.

An important but often overlooked element of reclamation is the reduction of soil compaction. Compaction is likely to occur under most situations along the pipeline ROW where construction traffic has compacted the soil. Ripper-teeth equipment may be used to loosen compacted surface soil, with the soil surface left rough. The BLM may require that all disturbances to be revegetated be ripped to reduce the adverse effect of compaction.

Additional attention may be focused on the following areas.

- At drainage crossings, such as Craven Creek, the banks could be replaced and stabilized as close to the original slope as possible. Banks could be stabilized to the original contour and made impassable;
- The BLM may require that steep slopes not be drill seeded up slope and downslope to avoid the creation of furrows which channel and concentrate overland flow, creating gullies. Steep slopes could be broadcast seeded to avoid rills or, if there was no vegetation present prior to construction, not seeded at all. In order to discourage vehicular traffic, these slopes could be left as rough as possible. Because much of the ROW parallels existing disturbances, waterbars could be continuous across the entire area of disturbance, not just the current project. (This would require cooperation on the part of all Operators);
- Because many of the soils are subject to piping and subsidence, adequate backfill compaction in the trench is important. There should be no berms left over the trench in anticipation of subsidence. Because many of these soils have rock fragments, especially north of Fontenelle, trenches must be backfilled to avoid berms of fractured sandstone.
- This ROW could be seeded as soon as construction activity is completed rather than only in the spring or fall.

In the event that new areas susceptible to erosion are found during construction activities, the BLM may require additional site-specific erosion control measures be applied to reduce erosion and facilitate revegetation.

4.4 WATER RESOURCES

4.4.1 Significance Criteria

Significant impacts to surface waters would occur if water quality standards would be violated or if project activities resulted in a downgrading of existing WDEQ or WGFD stream classifications.

4.4.2 The Proposed Action

JGGC's bore crossing of the Green River would cause no increase in sedimentation from bank erosion. If water courses are altered, including intermittent streams, riparian vegetation could be affected. The development and implementation of a SWPP Plan prior to surface-disturbing activities and implementation of the applicant-committed practices outlined in Chapter 2.0 would ensure that impacts to water resources would be minimized and would not violate water quality standards or cause a change in stream classification. Disturbance would be minimized and conducted during the time of year that would limit damage to habitats and sediment discharge to the river; therefore, impacts to rivers would not be significant.

4.4.3 No Action Alternative

No surface disturbance would occur under the No Action Alternative; therefore, no impacts to water resources would occur.

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4.4.4 Mitigation

With implementation of applicant-committed mitigation measures, no additional mitigation is recommended.

4.5 VEGETATION [illegible] AREAS

4.5.1 Significance [illegible]

Impacts to vegetation resulting from the Proposed Action would be considered significant if they resulted in a long-term reduction in vegetation productivity or a permanent change in species composition. Impacts to riparian areas/wetlands would be considered significant if they resulted in long-term loss of wetland or riparian habitat, or violation of E.O. 11990.

4.5.2 The Proposed Action

The proposed pipeline route would disturb approximately 488 acres of vegetation. All land disturbed by construction activities would be reclaimed and revegetated shortly after disturbance. Vegetation density and species composition would be altered on disturbed areas, resulting in higher production of grasses for approximately 20 years until shrubs become reestablished. No trees would be removed at the Green River crossing. Implementation of reclamation procedures would control erosion and expedite revegetation; therefore, impacts to vegetation would not be significant.

Operators would implement applicant-committed practices when crossing riparian areas. JGGC would bore under the Green River and their associated wetlands, thereby avoiding impacts to the surface. Disturbance would be minimized and conducted during the time of year that would limit damage to the habitat and sediment discharge to the rivers; therefore, impacts to riparian areas/wetlands would not be significant.

Surface disturbance activities could affect special status plants directly and indirectly by destroying individuals or their habitat, and introducing weeds. Weedy species often thrive on disturbed sites such as road rights-of-way and out-compete more desirable plant species. Increased weed invasion may render a site less productive as a source of forage for wildlife and livestock.

4.5.3 No Action Alternative

Under the No Action Alternative, no vegetation or riparian areas would be disturbed.

4.5.4 Mitigation

Monitoring should occur for weed species identified by the State of Wyoming and the BLM. Should weed species be found during monitoring, control and eradication efforts should be implemented following applicable County control procedures. Further, construction contractors should be required to clean vehicles and equipment of weed seed prior to entering the project area.

With implementation of applicant-committed mitigation measures in Chapter 2 (section 2.8), no additional mitigation is recommended.

4.6 SOCIOECONOMIC/ENVIRONMENTAL JUSTICE

4.6.1 Socioeconomic

Socioeconomic effects of the proposed pipeline and ancillary facilities would be largely positive. The combined construction workforce for the pipeline and compressor station would peak at an estimated 80 workers. Pipeline construction would require an estimated 75 days; compressor station construction would require an estimated 90 days.

Although some construction workers would be hired from the available local workforce, non-local construction workers would require temporary housing (motel rooms or pads in RV parks) while they are working on the project. These workers would be able to find temporary accommodations in LaBarge or Kemmerer.

Construction accidents could generate demand for emergency response services; these services are provided by agencies located in LaBarge and Kemmerer. Demand for emergency services is anticipated to be minimal, given the relatively small construction workforce and the short duration of construction.

The proposed pipeline would generate ad valorem property tax revenues to Sublette, Lincoln and Sweetwater counties, certain special districts and school districts and the Wyoming State School Foundation Fund. These revenues would be based on 11.5 percent of the value of the pipeline, compressor station and other facilities and the appropriate mill levies.

Sales and use tax revenues would be generated from the purchase and use of materials, equipment and supplies. In the case of the statewide 4 percent sales and use tax, these revenues would accrue to the State of Wyoming (72 percent) and the counties where the pipeline is located (28 percent less administrative costs). The county share would be further distributed to incorporated municipalities within the county, using a population-based formula. Both Lincoln and Sweetwater County impose an additional one percent general purchase sales tax which is distributed to each county and its municipalities using the same formula as the local share of the statewide tax.

By enabling production, transmission and sales of an estimated daily average of 300 to 400 MMCF of gas per day, the pipeline would contribute to substantial economic and fiscal benefits for affected counties and municipalities, the State of Wyoming and the nation as a whole. The University of Wyoming Agricultural Economics Department recently updated its Southwest Wyoming Input-Output Model, developed for the BLM's 1997 Southwest Wyoming Resource Evaluation. The model estimated that each MMCF of natural gas produced in southwest Wyoming during 2002 would generate a total economic impact of $3,403.38. Using this estimate and assuming an average daily production of 350 MMCF for a full year, the proposed pipeline would enable an estimated $435 million in total economic impact for southwest Wyoming during 2002, and similar amounts thereafter for the productive life of the fields, depending on production volumes and gas prices.

4.6.2 Environmental Justice

The proposed pipeline would not directly affect the social, cultural, or economic well-being and health of minorities or low income groups. The pipeline is relatively distant from population centers, therefore no populations would be subjected to physical impacts from the pipeline or ancillary facilities. Low income groups may indirectly benefit from the increased economic activity and job opportunities resulting from increased production enabled by the pipeline.

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4.7 CULTURAL RESOURCES

4.7.1 Significance Criteria

Significant impacts to cultural resources would include:

- loss of NRHP qualities of cultural resources that are eligible for the NRHP;
- any surface disturbing activities within 0.25 mi of a historic trail, unless such disturbance would not be visible from the trail or would occur in an existing visual intrusion within the buffer; and
- disturbance of important sites of religious or cultural significance to Native Americans.

4.7.2 The Proposed Action

The proposed JGGC and pipeline would not affect any known, intact, significant cultural resources, but there is a moderate potential for encountering buried cultural materials undetected during Class III inventories (Murray 1998). Based on Class III cultural resources inventories, Sines (1998a, 1998b, 1998c) and Murray (1998) recommend cultural resources clearance for the proposed pipeline route, following the terms and conditions of the approved archaeological discovery plans for open trench inspections during construction. Since the pipeline would cross historic trails at non contributing portions of the overall trail systems, no significant adverse effects to affected trail variants are anticipated (Sines 1998a). Based on consultation with Native Americans, no adverse impacts to known religious or culturally significant sites would occur as a result of the proposed construction activities.

Mitigation measures described below along with the applicant-committed practices outlined in Section 2.8.3 would ensure that no significant impacts to cultural resources or historic trails occur.

Based on a field investigation, no adverse impacts are anticipated to occur to known Native American sites of religious or cultural significance.

4.7.3 No Action Alternative

Under the No Action Alternative, no project-related disturbance of cultural resources would occur.

4.7.4 Mitigation

Cultural clearance has been recommended for the proposed pipeline. The project would impact a total of 55 sites, but the area of impact is restricted to non-contributing portions of significant sites or non-eligible sites. As cultural resources that are not eligible for the NRHP are not considered "historic sites", then by the Advisory Council's guidelines for Section 106 compliance there would be no effect to any historic properties by the construction or maintenance of the proposed pipeline. As a result, no additional mitigation is recommended.

4.8 NOISE

4.8.1 Significance Criteria

Long-term exceedance of federal standards for noise (55 dBA) at existing residences or other noise-sensitive areas would be considered a significant impact.

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4.8.2 The Proposed Action

Short-term sound levels during construction would exceed existing background levels; however, noise impacts would be short-term, would end when construction is completed, and are not anticipated to result in significant impacts.

Noise generated by compressor engines would be loud (estimated at approximately 65 dBA on-site and 40 dBA at 0.25 mile) for the LOP. However, no noise sensitive areas, including a known sage grouse lek near the Jonah Gas Hub, occur within 0.25 mile of the proposed compressor site, so none would be affected.

4.8.3 No Action Alternative

Under the No Action Alternative, no construction activity would occur; therefore, there would be no impacts resulting from construction related noise.

4.8.4 Mitigation

The BLM may require that no construction activities take place during raptor nesting, sage grouse strutting or nesting, or big game crucial winter periods in sensitive areas.

4.9 VISUAL RESOURCES

4.9.1 Significance Criteria

Any action that would violate VRM class guidelines or cause a downgrading of VRM class in any area would be a significant impact.

4.9.2 The Proposed Action

Most of the project area is designated VRM Class IV and the objectives of Class IV areas are to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high and management activities may dominate the view. The Class II and III areas crossed by the pipeline near the Green River crossing would be adjacent to existing roads and other pipeline ROWs. Visual disturbance under the Proposed Action would not exceed the criteria for maintaining the VRM classes; therefore, no significant impacts are anticipated.

4.9.3 No Action Alternative

There would be no additional impacts to, or changes in, existing visual resources under the No Action Alternative since no project-related disturbance would occur.

4.9.4 Mitigation

No additional mitigation is recommended.

4.10 WILDLIFE AND FISHERIES

4.10.1 Significance Criteria

Impacts to wildlife resources would be considered significant if any project-related action would:

- prevent realization of WGFD big game population objectives;
- result in the disruption of raptor breeding activities (and subsequent reproductive failure);
- result in the continuous disruption of sage grouse breeding activities; and/or
- prevent realization of WGFD fish population objectives.

4.10.2 The Proposed Action

Human presence and disturbance from pipeline and compressor station construction would disrupt animal activity and cause some loss of habitat. Disruption would be limited to the construction period, whereas habitat loss would occur for several years until revegetation is successful. Construction would disturb pronghorn crucial winter /year long and severe winter relief range, which would be reclaimed and revegetated during the first appropriate season after initial disturbance. Grasses and forbs would likely be available within one year for spring/summer/fall forage. The disturbance would also move shrubs, however, and it would likely be 20 or more years before shrubs would be available along the proposed pipeline route for pronghorn winter forage.

Disturbance during construction would be short-term and localized. Pronghorn in the area would have comparable adjacent habitat to use. and much of the construction would be adjacent to existing pipeline ROWs. Construction activities during crucial winter periods (November 15 through April 30) on occupied crucial winter ranges could have an adverse effect on wintering pronghorn populations.

No significant impacts to other big game species are anticipated since there would be disturbance to their crucial winter ranges. In addition, no significant impacts to migratory wildlife movements are anticipated since no fencing is proposed.

BLM biologists would determine nest occupancy of any raptor nests that occur close enough to potentially be disturbed by the construction activity. Because construction would be delayed until young have fledged, there would be no impacts to raptor nesting caused by the Proposed Action. Reduction in raptor prey species is not anticipated to be a concern since disturbance would occur on a small area relative to the total available prey habitat.

One sage grouse lek and eight sage grouse nesting areas occur within 2 miles of the proposed pipeline route; any sagebrush habitat within 2 miles of a lek is considered to be sage grouse nesting habitat. With the implementation of applicant-committed measures, there would be no disruption of sage grouse breeding or nesting activity due to the Proposed Action.

The Proposed Action would result in no measurable impacts to fish populations in the Green River because implementation of a SWPP Plan and applicant-committed practices, as well as prompt reclamation and revegetation, would limit the volume of sediments reaching the river.

Primary effects to other mammal, bird, and amphibian/reptile populations would occur in direct proportion to the amount of a species' habitat removed. Since total surface disturbance represents only a very small proportion of available habitats, impacts on these populations are not anticipated to be significant.

4.10.3 No Action Alternative

Under the No Action Alternative, no construction or maintenance activities would occur; therefore, there would be no impacts to wildlife and fisheries.

4.10.4 Mitigation

To protect wintering pronghorn, BLM may prohibit construction activity between November 15 and April 30 in severe winter relief and/or crucial winter ranges (Lovell 1998). Crucial winter range stipulations for pronghorn antelope may be applied in the following areas:

- Sections 21, 22, 27, 28, 32, 33, and 34 in T23N, R111W;
- Sections 3 and 5, T22N, R111W.

To protect nesting raptors, the BLM may require that no construction activity occur between February 1 and July 31 in the following areas (Lovell 1998):

- Section 33, T22N, R112W; and
- Section 16, T23N, R111W.

The BLM may require no construction activity in Section 5, T22N, R111, Section 32, 33, and 34, T21N, R112W, Section 1, T21N, R113W, and in Sections 10 and 15, T25N, R111W, between February 1 and May 15 to protect sage grouse leks (Lovell 1998; personal communication, October 20,1998, with J. Hamilton, B. Wichers, WGFD, Cheyenne). To protect known sage grouse nesting areas, the BLM may limit construction activities from April 1 to July 1 in the following sections:

- Sections 5, 6, 7, and 18, T22N, R111W;
- Sections 25, 26, 31, 32, 33. 34, and 35, T22N, R112W;
- Section 1, 3, 6, 9, and 16, T21N, R112W;
- Sections 2 and 10, T21N, R113W; and
- Sections, 28, 32, and 33, T23N, R111W.

If construction were to occur between April 1 and July 1, a survey will be required prior to the start of activities by the BLM in suitable nesting habitat along and within 150 ft of either side of the ROW/TUP by a BLM biologist or BLM-approved biologist. If a sage grouse nest is encountered, construction may be delayed within 150 ft of the nest until the young birds have fledged or the pipeline may be rerouted to avoid the nest.

4.11 THREATENED, ENDANGERED, CANDIDATE, AND SPECIAL STATUS SPECIES

4.11.1 Significance Criteria

Any action that would result in a jeopardy opinion for a federally listed T&E species would be considered a significant impact. Any action that would cause a candidate species to be listed as T&E would be a significant impact.

4.11.2 The Proposed Action

4.11.2.1 T&E Animal Species

Bald eagles would be protected by the applicant-committed mitigation measures designed for

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raptors. Due to the rarity of sightings of peregrine falcons and whooping cranes in the area, the Proposed Action is not likely to have a significant impact on these species. Although it is unlikely that black-footed ferrets inhabit areas along the proposed pipeline route, white-tailed prairie dog colonies are common and could provide potential ferret habitat. To protect black-footed ferrets potentially occurring in the area, Operators would implement ferret surveys of suitable white-tailed prairie dog colonies affected by the proposed pipeline route as directed by the BLM and/ or USFWS (Long 2001). Because no known habitat for Canada Lynx occurs in the project area and the most recent sightings of this animal occurred more than 20 years ago, the Proposed Action is not likely to adversely impact this species.

4.11.2.2 T&E Fish Species

The four USFWS-listed T &E fish species (bonytail chub, humpback chub, Colorado squawfish, and razorback sucker) that occur within the Colorado River system could be adversely affected by surface water withdrawals from the Green River for hydrostatic testing and dust control. The USFWS has determined, however, that progress made under the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" has been sufficient to offset impacts due to depletions of 100 acre-ft or less (memorandum dated March 9, 1995, to Assistant Regional Director, Ecological Services, Region 6, from Regional Director, Region 6, "Intra-Service Section 7 Consultation for Elimination of Fees for Water Depletions of 100 acre-ft or Less from Upper Colorado River Basin"). Because the proposed combined pipeline projects would require a total water withdrawal of less than 20 acre-ft from the Green River, there would be no significant impact on (i.e., is not likely to result in a jeopardy opinion) the listed fish species.

4.11.2.3 Sensitive and Candidate Wildlife Species

The Proposed Action is not likely to jeopardize the status of sensitive or candidate wildlife species. With construction of river crossings at times of low water flow and the use of applicant-committed practices and erosion control techniques, the Proposed Action is not likely to impact sensitive fish or bird species. Sensitive birds in the vicinity of Seedskadee National Wildlife Refuge would be protected by mitigation measures for raptors. Because habitat disturbance would be minimal, it is unlikely that birds or pygmy rabbits would be permanently displaced. In the case of burrowing owls, displacement is not likely to have a significant effect because of the availability of suitable habitat (prairie dog colonies) outside proposed pipeline corridors. Because no known habitat for wolverine occurs in the project area and the most recent sightings of this animal occurred more than 20 years ago, the Proposed Action is not likely to adversely impact this species.

Disturbance of sagebrush-grasslands may reduce potential habitat for mountain plover. Because mountain plovers nest on the ground, they would be vulnerable to mortality by vehicles and construction equipment, particularly along two-track roads and in undeveloped areas (BLM 1995a). The Proposed Action would not jeopardize mountain plover populations.

4.11.2.4 Threatened, Endangered and Sensitive Plant Species

Potential habitat for sensitive plants (including Ute ladies' tresses) has been documented in the area (BLM 1995a, 1995b). Extensive surveys for Ute ladies' tresses have been conducted by the BLM in the project area and none have been found. No additional surveys Ute ladies' tresses will be required. The proposed pipeline route north of the existing Mountain Gas Compressor Station in Section 14, T24N, R111W, was cleared for sensitive plants in 1996 (BLM 1996b). The proposed surveys south of this compressor reveal the presence of sensitive plant species in areas to be affected, these plants would be avoided or additional site-specific mitigation measures would be applied (section 4.11.4). Therefore, no significant impacts are anticipated.

4.11.3 No Action Alternative

No impacts to T&E, candidate, and/or sensitive plant and animal species would occur as a result of the No Action Alternative since no project-related disturbance would occur.

4.11.4 Mitigation

USFWS guidelines call for minimizing human disturbance within one-mile of bald eagle nesting areas between February 1 and August 15 (Long 2001), and if the bald eagle nest near the Green River crossing is occupied, no construction activities would occur within one-mile of the nest during this period to prevent displacement of adults and to allow the young to fledge. No formal consultation with the USFWS is anticipated. The BLM may request that JGGC instruct all pipeline workers and contractors to avoid bald eagle nesting, roosting, and foraging areas and to leave these areas (i.e., Green River crossing site) as soon as construction is complete.

If construction activities would occur between April 1 and July 31, the BLM may require field surveys for nesting mountain plovers in compliance with USFWS survey protocol, and if nesting activity is discovered, the BLM may require construction activities be delayed to allow the young to fledge.

To minimize human-caused disturbance of sensitive wildlife species, the BLM may require Operators to inform all pipeline workers and contractors of applicable wildlife laws and the penalties associated with unlawful take and harassment of wildlife species, particularly T &E species.

The BLM could require sensitive plant species habitat mapping and site-specific field surveys and clearances along uncleared areas of the pipeline ROW (see Maps 3.6, 3.7, and 3.8 in the Environmental Assessment and Finding of No Significant Impact for the Bird Canyon-Opal Pipeline, Granger Spur Pipelines, and One Compressor Station, Sublette, Sweetwater, and Lincoln Counties, Wyoming, BLM 1999). Habitat mapping, site-specific field surveys, and clearances would be conducted by a BLM-qualified botanist and occur during appropriate seasons (May-August for BLM special status plant species) if it is determined during field surveys that these plants may be affected, the pipeline would be rerouted and/or additional mitigation measures (including consultation with the USFWS) would be applied. Survey field data forms and supporting documentation (e.g., maps, photos, etc.) would be provided to the BLM botanist prior to construction.

4.12 WILD HORSES

4.12.1 Significance Criteria

Any activity that resulted in substantial habitat loss for wild horses or a permanent reduction in population numbers below BLM management levels would be considered a significant impact.

4.12.2 The Proposed Action

The Proposed Action would result in the short-term disturbance of approximately 195 acres in the Little Colorado Desert WHHMA. Horses would likely move to adjacent habitats during pipeline construction, and the area would be revegetated with palatable forage. For these reasons, the Proposed Action would not significantly impact wild horses or their habitat. The level of development in this area has and will continue to impact the opportunity to observe the horses in a natural, wild-free roaming environment.

4.12.3 No Action Alternative

Because there would be no habitat disturbance, there would be no impact to wild horses under the No Action Alternative.

4.12.4 Mitigation

No additional mitigation was identified.

4.13 RANGE/OTHER LAND USES

4.13.1 Significance Criteria

Impacts to surface ownership/use would be significant if the pipeline precluded other current uses adjacent to the pipeline route or if there would be a reduction in AUMs of a magnitude that would require modifications in grazing allotments or other actions that would prevent the realization of grazing goals.

4.13.2 The Proposed Action

The proposed construction activities would be compatible with zoning classifications in all counties associated with the project. The Proposed Action would result in disturbance to forage supporting permitted livestock within the project area. Additionally, parking or other activities in the vicinity of livestock watering areas may prevent livestock use of these areas and/ or cause increased livestock stress. With rapid construction and associated revegetation, the pipeline route would likely produce more grass forage within the first few years than is produced under existing conditions because the grass would have little competition from shrubs during the initial stages of revegetation. For these reasons, impacts to livestock and grazing management would be short-term and would not be significant.

The Proposed Action would not have a significant impact on any of the resources that contribute to healthy rangelands, such as:

- stable soils that allow for water infiltration, optimal plant growth, and minimal surface runoff;
- healthy riparian areas;
- healthy upland vegetation;
- habitat capable of supporting native plant and animal species, including sensitive plant species;
- water quality that meets state standards; and
- air quality that meets state standards.

4.13.3 No Action Alternative

There would be no impacts from the No Action Alternative because there would be no change in surface use and no disturbance of forage.

4.13.4 Mitigation

The BLM may require the avoidance of parking and other activities near livestock water sources during non construction periods to avoid or reduce potential impacts to livestock.

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4.14 UNAVOIDABLE ADVERSE IMPACTS

4.14.1 The Proposed Action

The Proposed Action would disturb approximately 488 acres, thus increasing the potential for wind and water erosion before the land is revegetated. Other unavoidable adverse impacts are a short-term loss of vegetation and forage production, the temporary loss of livestock forage, short-term turbidity and some sedimentation at trench crossings of river, short-term impacts to air quality/noise levels due to construction activities, short-term loss of pronghorn crucial winter range and wild horse habitat, and possible temporary disruption of wildlife activities during construction.

4.14.2 No Action Alternative

Under the No Action Alternative, there would be no beneficial economic impacts to local economies.

4.15 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT VS. LONG-TERM PRODUCTIVITY

4.15.1 The Proposed Action

Short-term use of the environment would facilitate and enhance natural gas transportation and stimulate local economies. Environmental impacts would be short-term and insignificant. The proposed project would not adversely affect long-term use and would enhance long-term productivity related to natural gas supplies.

4.15.2 No Action Alternative

There would be no changes in short-term use under the No Action Alternative. Long-term productivity in terms of natural gas transportation would be reduced.

4.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.16.1 The Proposed Action

Irreversible or irretrievable commitments of resources would include the depletion of energy, materials, and manpower necessary to implement the Proposed Action.

4.16.2 No Action Alternative

There would be no resource commitments under the No Action Alternative.

4.17 CUMULATIVE IMPACTS

Cumulative environmental impacts are those resulting from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions, regardless of who is responsible for such actions. They may result solely from human activities or in combination with natural events and processes. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative impacts of natural gas development in the Fontenelle, Moxa Arch, Jonah II, and Pinedale Anticline cumulative impact analysis area have been extensively documented (BLM 1999a, 1999b, 1997c, 2000d), and no cumulative impacts beyond those described in these documents would occur as a result of this project. The Opal Loop pipeline, Sublette, Sweetwater, and Lincoln Counties, Wyoming project would provide beneficial impacts to local economies. There would be no changes in land use, although natural gas recovery would become a more dominant use and require more coordination with other area uses. There would be no significant cumulative impacts to air quality beyond those described for the Pinedale Anticline project (BLM 2000d). During pipeline construction, there would be only short-term increases in particulates, but there would be no violations of state or federal air quality standards. Compressor station emissions would fall below the level analyzed in the Pinedale Anticline project. Sedimentation to the Green River would be negligible, and impacts to vegetation would not be significant. Sensitive plants and T &E species would be protected. There would be a small reduction in big game habitats, including crucial winter ranges, but none would be significant.

The Opal Loop pipeline, Sublette, Sweetwater, and Lincoln Counties, Wyoming project is not expected to contribute significantly to adverse cumulative impacts.

CHAPTER 5

CONSULTATION AND COORDINATION

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CHAPTER 5

CONSULTATION AND COORDINATION

5.0 CONSULTATION AND COORDINATION

An environmental assessment (EA) must be prepared when a federal government agency considers approving an action within its jurisdiction that may impact the human environment. An EA aids federal officials in making decisions by presenting information on the physical, biological, and social environment of a proposed project and its alternatives. The first step in preparing an EA is to determine the scope of the project, the range of action alternatives, and the impacts to be included in the document.

The Council on Environmental Quality (CEQ) regulations (40 CFR, Parts 1500-1508) require an early scoping process to determine the issues related to the proposed action and alternatives that the EA should address. The purpose of the scoping process is to identify important issues, concerns, and potential impacts that require analysis in the EA and to eliminate insignificant issues and alternatives from detailed analysis.

The Opal Loop Natural Gas Pipeline and Compressor Station project EA was prepared by a third party contractor working under the direction of and in cooperation with the lead agency for the project, which is the Bureau of Land Management (BLM), Rock Springs Field Office, Rock Springs, Wyoming.

5.1 PUBLIC PARTICIPATION

A Scoping Notice was prepared and submitted to the public by the BLM on April 13, 2001 requesting input into the proposed Opal Loop project. Scoping documents were sent out to the public listed on the BLM mailing list, as well as organizations, groups, and individuals requesting a copy of the scoping document.

There were seven written responses received during the scoping period in response to this project. These written responses did not state a position in regard to the project but provided suggested mitigation if the project were implemented. The issues and concerns identified by the public during the scoping period are summarized in Chapter 1.

During preparation of the EA, the BLM and the consultant interdisciplinary team (IDT) have communicated with, and received or solicited input from various federal, State, county, and local agencies, elected representatives, environmental and citizens groups, industries, and individuals potentially concerned with issues regarding the proposed drilling action. The contacts made are summarized in the following sections.

The following organizations/individuals either provided comment or were provided the opportunity to comment during the scoping period.

FEDERAL AGENCIES

Federal Energy Regulatory Commission
Department Of Energy
U.S. Environmental Protection Agency,
  Region 8
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Representative Barbara Cubin
U.S. Senator Craig Thomas

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U.S. Senator Michael B. Enzi
USDA Forest Service
USDA National Park Service

STATE AGENCIES

Governor, Jim Geringer
State Representatives
Wyoming Department of Transportation
Wyoming Oil and Gas Conservation Commission
Wyoming Department of Environmental Quality
State Senators
Wyoming Office of Federal Land Policy
Wyoming Game and Fish Department
Wyoming State Historic Preservation Office

COUNTY GOVERNMENT

Lincoln County Commissioners
Sweetwater County Commissioners
Sublette County Commissioners

MUNICIPALITIES

Mayor of Big Piney
Mayor of Fort Bridger
Mayor of Green River
Mayor of Lyman
Mayor of Mountain View
Mayor of Diamondville
Mayor of Granger
Mayor of LaBarge
Mayor of Marbleton
Mayor of Opal

NATIVE AMERICAN TRIBES

Arapaho Wind River Traditional Elders
Eastern Shoshone National
Northern Ute Cultural Committee
Shoshone Tribal Cultural Center
Shoshone-Bannock Tribal Office
Arapahoe Business Council
Northern Arapaho Business
Shoshone Tribal Business Council
Shoshone-Arapaho
Shoshone-Bannock Tribes

LOCAL MEDIA

A press release was sent to local media.

LANDOWNERS, INDUSTRY REPRESENTATIVES, AND GRAZING PERMITTEES

This scoping notice has been sent to known property owners, industry representatives, and grazing permittees that would be affected by this project.

OTHER AGENCIES AND INDIVIDUALS

National Wildlife Federation
Oregon/California Trails Association
People for the USA
People for Wyoming
Petroleum Association of Wyoming
Sierra Club/Wyoming Chapter
Sierra Club - Regional Director
Sweetwater Wildlife Association
Southwest Wyoming Mule Deer Foundation
The Wilderness Society
The Nature Conservancy
Trout Unlimited
Western Mule Deer Foundation
Wyoming Outdoor Council
Wyoming Public Lands Council

5.2 LIST OF PREPARERS

The following tables identify the core BLM IDT (Table 5-1) and the consultant IDT (Table 5-2) that were principally involved with preparing this EA.

Table 5-1. List of BLM Interdisciplinary Reviewers.

Name	Responsibility
KEMMERER FIELD OFFICE	
Kelly Lamborn	Realty
Wally Mierzejewski	Visual Resources/Recreation
Lynn Harrell	Cultural Resources
Pat Netherly	Vegetation/Range Issues
Gary McNaughton	Paleontology/Geology
Arlan Hiner	Air Quality/Compression needs, Socio/Economic
Carl Bezanson	Riparian/Wetland
Gavin Lovell	Wildlife/T & E Issues
Jim Wright	Wildlife/T & E Issues
ROCK SPRINGS FIELD OFFICE	
Becky Heick/Patricia Hamilton	BLM IDT Lead, Realty
John MacDonald	Soils/Pipeline construction/reclamation
Dennis Doncaster	Hydrology/Water Quality
Terry A. Del Bene	Cultural Resources
Jay D'Ewart	Vegetation/Range Issues
John Henderson	Fisheries
Jim Dunder	Wildlife/T & E Issues
Jim Glennon	Zone Botanist
Thor Stephenson	Wild Horses
WYOMING STATE OFFICE	
Susan Caplan	Air Quality

Table 5-2. List of Consultant Interdisciplinary Team EA Preparers.

[illegible]	[illegible]	[illegible]
Gary Holsan	Gary Holsan Environmental Planning	Interdisciplinary Team Leader, Project Manager, Recreation, Visual Resources
Larry Hayden-Wing	Hayden-Wing Associates	Wildlife/Fisheries, Special Status Animals and Fish, Vegetation and Wetlands
George Blankenship	Planning Information Corporation	Socioeconomics, Range, Other Land Use
Jim Zapert, Susan Eatinger	TRC Environmental Corporation	Air Quality
Bill Current	Current Archaeological Research	Cultural Resources
Charles Bucans, P.E.	Star Valley Engineering	Pipeline Construction/Reclamation

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APPENDIX A

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APPENDIX A

Table A-1. Hazardous and Extremely Hazardous Materials to be Used During Construction and Operation of the Proposed JGGC Pipeline and Compressor Station.

Material	Approximate Quantity	Hazarrious Substances	CAS #
Transportation Products			
Natural Gas	350 MMCFD[1]	n-Hexane	110-54-3
		PAHs[2]	–
		POM[3]	–
Emissions			
Gases	Unknown		
		Formaldehyde	50-00-0
	>40.6 tpy[4]	NO_x	10102-44-0[5]
		Ozone[6]	10028-15-6
		Sulfur dioxide[4]	7446-09-5
		Sulfur trioxide[6]	7446-11-9
VOCs	>33.7 tpy		
		Benzene	71-43-2
		Ethylbenzene	100-41-4
		n-Hexane	100-54-3
		PAHs	–
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Particulates	Unknown	Barium	7440-39-3
		Cadmium	7440-43-9
		Copper	7440-50-8
		Fine mineral fibers	–
		Lead	7439-92-1
		Manganese	7439-96-5
		Nickel	7440-02-2
		POM	–
		Zinc	7440-66-6
Miscellaneous Materials			
Antifreeze	Unknown	Acrolein	107-02-8
		Cupric sulfate	7758-38-7
		Ethylene glycol	107-21-1
		Freon	76-13-1
		Phosphoric acid	766-38-2

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APPENDIX A

Table A-1 (Continued)

Material	Approximate Quantity	Hazardous Substances	CAS #
Miscellaneous Materials (cont.)			
Antifreeze (cont.)		Potassium hydroxide	1310-58-3
		Sodium hydroxide	1310-73-2
		Triethylene glycol	112-27-6
Batteries	Unknown	Cadmium	7440-43-9
		Cadmium oxide	1306-19-0
		Lead	7439-92-1
		Nickel hydroxide	7440-02-0
		Potassium hydroxide	1310-58-3
		Sulfuric acid	7664-93-9
Cleaners	Unknown	Hydrochloric acid	7647-01-0
Fuels			
Diesel fuel	Unknown	Benzene	71-43-2
		Cumene	98-82-8
		Ethylbenzene	100-41-4
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	–
		POM	–
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Gasoline	Unknown	Benzene	71-43-2
		Cumene	98-82-8
		Cyclohexane	110-82-7
		Ethylbenzene	100-41-4
		n-Hexane	110-54-3
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	–
		POM	–
		Tetraethyl lead[a]	78-00-2
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3

APPENDIX A

Table A-1 (Continued)

Material	Approximate Quantity	Hazardous Substances	CAS #
Fuels (cont.)			
Natural gas	Unknown	n-Hexane	110-54-3
		PAHs	--
		POM	--
Pipeline Materials			
Coating	Unknown	Aluminum oxide	1334-28-1
Cupric sulfate solution	Unknown	Cupric sulfate	7758-98-7
		Sulfuric acid	7664-93-9
Diethanolamine	Unknown	Diethanolamine	111-42-2
LP Gas	Unknown	Benzene	71-43-2
		n-Hexane	110-54-3
		Propylene	115-07-1
Molecular sieves	Unknown	Aluminum oxide	1344-28-1
Pipeline primer	Unknown	Naphthalene	91-20-3
		Toluene	108-88-3
Potassium hydroxide	Unknown	Potassium hydroxide	1310-58-3
Rubber resin coatings	Unknown	Acetone	67-64-1
		Coal tar pitch	68187-57-5
		Ethyl acetate	141-78-6
		Methyl ethyl ketone	78-93-3
		Toluene	108-88-3
		Xylene	1330-20-7
Fertilizers	Unknown	Unknown	
Herbicides	Unknown	Unknown	
Lead-free thread compound	Unknown	Copper	7440-50-8
		Zinc	7440-65-6
Lubricants	Unknown	1,2,4-trimethylbenzene	95-63-6
		Barium	7440-39-3
		Cadmium	7440-43-9
		Copper	7440-50-8
		n-Hexane	110-54-3
		Lead	7439-92-1
		Manganese	7439-96-5
		Nickel	7440-02-0
		PAHs	--
		POM	--
		Zinc	7440-66-6

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Table A-1 (Continued)

Material	Approximate Quantity	Hazardous Substances	CAS #
Pipeline Materials (cont.)			
Motor oil	Unknown	Zinc compounds	–
Paints	Unknown	Aluminum	7429-90-5
		Barium	7440-39-3
		n-Butyl alcohol	71-36-3
		Cobalt	7440-48-4
		Lead	7439-92-1
		Manganese	7439-96-5
		PAHs	–
		POM	–
		Sulfuric acid	7664-93-9
		Toluene	108-88-3
		Triethylamine	121-44-8
		Xylene	1330-20-7
Sealants	Unknown	1,1,1-trichloroethane	71-55-6
		n-Hexane	110-54-3
		PAHs	–
		POM	–
Solvents	Unknown	1,1,1-trichloroethane	71-55-6
		Acetone	67-64-1
		t-Butyl alcohol	75-65-0
		Carbon tetrachloride	56-23-5
		Isopropyl alcohol	67-63-0
		Methyl ethyl ketone	108-10-1
		Methanol	67-56-1
		PAHs	–
		POM	–
		Toluene	108-88-3
		Xylene	1330-20-7
Starting fluid	Unknown	Ethyl ether	60-29-7

---

[1] MMCFD = million cubic feet per day, potential total.
[2] PAHs = polynuclear aromatic hydrocarbons.
[3] POM = polycyclic organic matter.
[4] tpy = tons per year.
[5] CAS # for nitrogen dioxide, an extremely hazardous material.
[6] Extremely hazardous material.

APPENDIX B

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May 30, 2001

Mr. Arlan Hiner
Bureau of Land Management
Rock Springs Field Office
280 Hwy 191 North
Rock Springs, Wyoming 82901

Subj: Southwest Wyoming NOx Emissions Changes since the
Pinedale Anticline Project Cumulative Analysis

Dear Mr. Hiner,

This letter is in response to a request by the BLM to determine the status of NOx emissions in southwest Wyoming since a cumulative modeling analysis was performed for the Pinedale Anticline Project (PAP). The PAP analysis included facilities permitted as of December 31, 1998, as well as reasonably foreseeable development in the region based on data from Environmental Impact Statements (EIS) and Environmental Assessments (EA).

A regional inventory of NOx emissions permitted since the PAP analysis indicates total annual NOx emissions in southwest Wyoming have decreased:

- 154 tons per year without the inclusion of emissions reductions at the Pacificorp Naughton facility, and
- 10,961 tons per year if Pacificorp Naughton emissions reductions are included.

In addition, an inventory of NOx emissions in the Jonah II Project Area (J2PA) permitted and proposed since the PAP analysis indicates that total annual NOx emissions in the J2PA have increased 14.1 tons per year over levels analyzed in the PAP. This increase includes both the Jonah Gas Gathering Company (JGGC) County Line compressor station (CT-2252) permitted in February 2001 and the Mountain Gas Resources compressor station (CT-2280) permitted in April 2001.

The remainder of this letter summarizes the analyses performed to make these determinations and discusses the findings in greater detail.

Regional Source Inventory – January 1999 to Present

A summary of permit activity January 1999 to the present in the southwest Wyoming counties of Sublette, Sweetwater, Lincoln, and Uinta was obtained from the Wyoming Department of Environmental Quality (WDEQ). Due primarily to emissions reductions at the Pacificorp Naughton facility, 10,961 tons per year were removed from the regional annual NOx inventory. If reductions at the Naughton facility were excluded from this inventory, an overall decrease of 154 tons of NOx per year would be attributable to all other WDEQ-permitted sources in southwest Wyoming.

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Jonah II Field Source Inventory

An inventory of facilities in the J2PA that were modeled in the PAP analysis was performed to provide a basis for determining any NOx emissions increases or decreases since that analysis. The inventory was developed using data from the PAP EIS Technical Report (BLM, 1999) and digital files containing that data (Air Sciences, 2001), along with permit data obtained from WDEQ (WDEQ, 2001). All compression facilities known to exist in the J2PA as of December 31, 1998 were found to have been included in the PAP modeling analysis. No reasonably foreseeable development of compression was modeled within the J2PA presumably because levels of compression projected and approved in the original Jonah II EIS had been attained at that time. NOx emissions from all J2PA facilities modeled in the PAP are shown in Table 1, and reflect emission rates modeled in the analysis.

NOx emissions from existing permitted and proposed facilities in the J2PA were then inventoried. Emissions data for these facilities were obtained from WDEQ records (WDEQ, 2001) and from the recent JGGC County Line Compressor Station permit application. NOx emission totals for each existing or proposed facility are shown in Table 1, and include emissions from all permitted NOx sources at each facility.

Table 1 also calculates the net emissions increase or decrease for each facility since the PAP analysis, and calculates the total net change in NOx emissions in the J2PA. This net change was calculated to be 14.1 tons per year, indicating that NOx emissions in the J2PA have increased 14.1 tons per year over emission levels modeled in the PAP. Despite the presence of increased compression capabilities in the field, a large increase in NOx emissions did not occur due to several factors:

- Mountain Gas Resources' initial permit CT-1350, included in the PAP at 118.89 tpy NOx, expired in 2000.
- While several facilities have installed additional compression since December 1998, the commitment to lower NOx emission factors for compressor engines have resulted in a lesser increase in total permitted NOx emission levels.
- The Compression Specialties facility (now Jonah Gas), included in the PAP at 26.07 tpy, no longer exists. Jonah Gas is presently requesting that WDEQ rescind this permit.

Air Sciences, 2001. Electronic data from Pinedale Anticline Project Technical Support Document air emissions inventory provided by Rodger Steen, Air Sciences, Denver, Colorado. May 11, 2001.

BLM, 1999. Pinedale Anticline Oil and Gas Exploration and Development Project Draft EIS Technical Report. US Department of the Interior, Bureau of Land Management, Wyoming State office, Pinedale Field Office. DEIS-00-018. November, 1999.

WDEQ, 2001. Inventory of permitted sources in Lincoln, Sweetwater, Sublette, and Uinta counties and conversations with Cortnie Morrell, Wyoming Department of Environmental Quality, Air Quality Division, regarding that inventory. April-May, 2001.

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Table 1
Jonah II Project Area NOx Permit History

Company	Facility	WDEQ Permit No.	NOx Emissions Modeled in PAP Analysis (tpy)	Existing NOx Emissions (tpy)	Net Change (tpy)
Jonah Gas Gathering	Jonah West Pipeline Station (Yellowpoint Station)	CT-1296, MD-412	6.10	10.82	+4.72
Jonah Gas Gathering	Compression Specialties (now Jonah Gas)	CT-1257 [1]	26.07	0.00	-26.07
Jonah Gas Gathering	Bird Canyon Station	CT-1422, CT-1422A, MD-486	40.60	51.40	+10.80
Jonah Gas Gathering	Luman Station	CT-1423, MD-413, MD-485	60.40	85.10	+24.70
Mountain Gas Resources	Compressor Station	CT-1350 (expired in 2000)	118.89	0.00	-118.89
Mountain Gas Resources	Compressor Station	CT-2280	--	54.90	+54.90
Jonah Gas Gathering	County Line Station	CT-2252	--	63.90	+63.90
				Net Change in Jonah Field Total NOx Emissions (tpy)	+14.1

1. Two compressors originally permitted under Compression Specialties, now Jonah Gas; units no longer exist, JGGC requesting permit be rescinded.

In summary, NOx emission levels in southwest Wyoming have decreased 10,961 tons per year (154 tons per year excluding Pacificorp Naughton) since the PAP analysis was completed. Field-wide NOx emission levels in the J2PA have increased 14.1 tons per year despite the development of increased compression in the field, including the proposed addition of the JGGC County Line compression facility.

Please contact me or Jim Zapert at (860) 289-8631 if you require any further information regarding this analysis.

Sincerely,

TRC ENVIRONMENTAL CORPORATION

Susan J. Eatinger

Susan J. Eatinger
Associate Project Scientist

cc: Jim Zapert, TRC

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BEGIN OPAL LOOP PROJECT
BUCKHORN
CANYON
COLORADO
E
SUBLETTE CO
T 27 N
T 26 N
SWEETWATER CO
LINCOLN CO
R 112 W
R 111 W
R 110 W
R 109 W
36
31
1
6
2215
2223
2197
2239
2214
2200
2177
2166
2006
2125
2192
2176
2100
2000
TRAIL
JEEP
EMIGRANT
Buckhorn Well No 1
Little Colorado Well No 7
Monument Butte Well
Spur Canyon
Steed Canyon
(SUBLETTE CUTOFF)
RIVER
SED PIPELINE
West
State

JGGC OPAL LOOP PROJECT

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1

R 112 W
R 111 W
2088
Well
2088
2092
36
31
T 25 N
T 24 N
1
R 112 W
R 111 W
6
2061
2021
OLN CO
WATER CO
Pipeline
R
2053
36
R 111 W
R 110 W
31
2097
Buckhorn
Well No 2
Eighteenmile
Knoll
2100
R 110 W
R 109 W
2100
EIGHTEENMILE
2000
2053
31
36
2074
BUCKHORN
R 111 W
R 110 W
6
T 25 N
T 24 N
R 110 W
R 109 W
6
Eighteenmile
Well
2000
1994
Little Colorado
Well No 3
2000
Fourm

JGGC OPAL LOOP PROJECT

SHEET: 2 OF 4

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2

Flowing Well
R 113 W
R 112 W
EMIGRANT
TRAIL
Slate
Slate Creek Butte
2089
Fontenelle
R 112 W
R 111 W
GREEN
RIVER
1998
Fourmile
R 111 W
R 110 W
1978
McCullen Bluff
1968
Pipeline
2000
1999
2011
LINCOLN CO
SWEETWATER CO
2000
Pipeline
1946
Dodge
2000
36
31
T 23 N
T 22 N
2034
1
Flowing Well
6
2011
2000
1990
Well
2037
36
31
PROPOSED PIPELINE
2000
6
1
312
GREEN
36
31
Horseshoe Bend
T 23 N
T 22 N
1998
Pipeline
1
6

JGGC OPAL LOOP PROJECT

SHEET: 3 OF 4

3

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PROPOSED PIPELINE
END AT WILLIAMS PROCESSING PLANT
T 21 N
R 115 W
R 114 W
R 113 W
R 112 W
Cow Hollow
Creek
Chrisman
Pipelines
Pipeline
Well
Opal Springs
Radio Tower
Pumping Sta
Opal
Ditch
Hams
Gravel Pit
Gravel Pits
1
6
31
36
2072
2100
2039
2071
2050
2175
2031
2060
2042
2021
2014
2037
2076
2082
2008
2044
2024
2113

JGGC OPAL LOOP PROJECT

SHEET: 4 OF 4

4

PLANT NORTH
TRUE NORTH
MAN GATE (TYP. 5)
B-C-203 COMPRESSOR THREE
B-C-202 COMPRESSOR TWO
B-C-201 COMPRESSOR ONE
BURIED LINE
METER STATION
B-P-603 SPENT LUBE OIL PUMP
DISCHARGE ESD VALVE
SUCTION ESD VALVE
B-X-302 INSTRUMENT/FUEL/START GAS SKID BUILDING
B-P-604 ENGINE COOLANT PUMP
B-TK-605 SPENT COOLANT TANK
B-TK-604 ENGINE COOLANT TANK
B-TK-201 LUBE OIL STORAGE TANK
VENT STACK
B-F-401 FLARE
PROPOSED COMPRESSOR BUILDING

Figure 2-4. Bird Canyon Compressor Site.

BIRD CANYON SITE PLAN (SCALE: 1 INCH = 50 FEET)

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